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Intellectual Property Protection for Plants and Varieties

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INTELLECTUAL PROPERTY PROTECTION

FOR PLANTS AND VARIETIES

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INTELLECTUAL PROPERTY PROTECTION FOR PLANTS AND VARIETIES

INTRODUCTION

While granting inventors an exclusive right to their creations for a limited time is authorized in the Constitution and has been in effect by statute since 1790, intellectual property protection for plants and varieties has developed in significance and type of protection during the last sixty years in the United States. The types of protection available in the United States include utility patents, plant patents, plant variety protection certificates and trade secrets. This report examines the history of intellectual property protection for plants and the relevant current federal statutes. These statutes and other forms of intellectual property protection are compared to highlight relative advantages and limitations.

Asexually reproduced plants are plants which are usually reproduced by cuttings, grafting, budding and the like, but not by seeds. Most of the plants can be reproduced by seeds but the resulting plants will not have the same qualities and properties as the original plant. Asexual reproduction assures the production of plants which are exactly the same. Plants which are asexually reproduced include flowering plants such as roses, chrysanthemums, African violets and lilies, fruits such as peaches, apples, oranges, grapes and strawberries, nuts

such as pecans and walnuts, shrubs such as azaleas, hollies and lilacs, conifers and broadleaf trees.

Sexually reproduced plants are plants which are reproduced by seed. These plants include varieties (often called inbreds) such as corn, sorghum and sunflowers, which are used to produce hybrids. The hybrids of these plants, and not their progeny, are the commercial product. The hybrids cannot be used to derive the original parent inbreds. Sexually reproduced plants also include varieties (non-hybrids) such as wheat and soybean, which are the commercial product, and their progeny can be used for seed.

HISTORY OF INTELLECTUAL PROPERTY PROTECTION FOR PLANTS

Three types of statutorily authorized intellectual property protection are currently available for protecting plants and varieties. As discussed in detail below, these are the plant patent, the plant variety protection certificate and the utility patent. Plant patents directed to asexually reproduced plants were first authorized by the 1930 Plant Patent Act (PPA). The 1970 Plant Variety Protection Act (PVPA) was enacted to provide patent-like protection to sexually reproduced plant varieties. General patent statutes covering the full range of human inventive art have been in effect in the United States since 1790. Only recently have plants been deemed to be patentable subject matter under the general patent statutes (hereafter

"utility patent(s)"). Utility patents were first allowed for plants and plant varieties following the decisions of Diamond, Commr. Patents v. Chakrabarty, 447 U.S. 303 (1980) and Ex parte Hibberd, 227 U.S.P.Q. 443 (BPAI 1985).

The Plant Patent Act of 1930

Prior to 1930, plant breeding and research were dependent, in large part, upon government funds to government experiment stations or upon the limited endeavors of the amateur breeder. The development of new varieties having disease resistance, cold tolerance, drought tolerance or medicinal properties was important to agriculture in the United States. However, for private industry financial incentives to develop new varieties were inadequate to recover costs and earn a sufficient profit. A new variety, once it left the hands of the breeder, could be reproduced in unlimited quantity by all. The breeder's only opportunity for financial reimbursement was through high prices in sales of comparatively few reproductions during the first two or three years following the development of the variety. Private industry required greater financial returns through plant patent legislation to offset increased investments of capital and increased plant development.[1]

In 1930, the Plant Patent Act (PPA)[2] was enacted into law. The purpose of the PPA was to encourage the

development of new varieties and to afford agriculture the benefits of the patent system. American agriculture had only recently suffered from the "phoney peach disease" that had threatened the peach supply upon which the State of Georgia was so dependent, and the "chestnut blight" that virtually destroyed an entire source of timber. It was believed that plant breeders could produce new disease-resistant, drought-resistant, and cold-resistant varieties of plants to extend the range of fruit crops and to blunt the effect of extremes in weather patterns.[3]

The Act provides a plant patent to a breeder which granted him an exclusive right to propagate the patented plant by asexual reproduction for a period of 17 years. That right did not extend to an exclusive right to propagate the patented plant by seeds, nor did the right extend to the plant per se other than as asexually reproduced. Congress intended only "to give the necessary incentive to preserve new varieties." Generally it was believed that seeds did not provide for a true-to-type reproduction, whereas such reproduction was provided by asexual reproduction. The new variety could continuously be reproduced by seeds, although such reproduction is undesirable.[4]

Prior to passage of the PPA, two factors were believed by many to prohibit plants from utility patent protection. These factors were that (a) plant varieties were products

of nature and thus not patentable under the general patent statute[5] and (b) a new plant variety could not be adequately described to comply with the description requirements of the general patent statutes.[6] In enacting the PPA, Congress concluded that the work of the breeder was an aid to nature and thus a patentable invention.[7] Congress recognized the difficulty inherent in describing a new plant variety, and permitted the description to be in accordance with traditional botanical description[8] by relaxing the written description requirement.[9]

Plant patents are directed to all plants which lend themselves to asexual reproduction. Plant patents cannot be obtained for seeds, tubers (i.e., the Irish potato and the Jerusalem artichoke) and wild varieties found in nature which are not asexually reproduced. Congress did not include the tuber-propagated plants in the PPA because only this group of asexually reproduced plants is propagated by the same part of the plant that is sold as food. However, bulbs, corms, stolons, and rhizomes were not considered to be within the tuber exception.[10] Wild varieties were excluded because they were considered to be products of nature.[11]

The grant of a plant patent was amended in the 1952 patent statute recodification[12] to include the phrases "or selling or using the plant so reproduced" and "the right to

exclude others." This amendment was made to harmonize the rights of a plant patent with those of a utility patent.[13]

Section 161 of Title 35 of the United States Code was amended in 1954 to insert the phrase "including cultivated sports, mutants, hybrids and newly found seedlings." A newly found seedling is a seedling plant developed by chance with no attention or effort by the owner.[14] The "chance" newly found seedling is considered to have resulted from the activity of the plant grower since he at least cultivated the original plants which led to the seedling.[15] The newly found seedling is protectable under the PPA if it is asexually reproduced. Asexual reproduction was believed to be the only method to provide a true-to-type reproduction of the seedling. Sexual reproduction was not believed to be able to accomplish it.[16] A plant produced from a seed could be protected as a newly found seedling if it was distinct and if it was asexually reproduced. This amendment was intended to clarify the original legislative intent of Congress, i.e., when the PPA was enacted, these items were to have been included within the scope of the plant patent.[17] However, in order to be protected under the PPA, all such plants must be asexually reproduced.[18]

Since 1930, over 6,000 plant patents[19] have been issued by the Patent Office. Plant patents are directed, for example, to ornamental flowering plants, ornamental

trees, fruit trees, nut trees, grapes and the like. The number of issued plant patents and the size of the present-day nursery industry reflect the positive economic effects of the PPA.

The Plant Variety Protection Act of 1970

Following the passage of the PPA in 1930, the primary development of new asexually reproduced varieties moved from government experiment stations to private industry. However, between 1930 and 1970 the development of new sexually reproduced varieties, i.e., non-hybrid cultivars (plants) which are pure strains and which breed true, was primarily undertaken by plant breeders at state agricultural experiment stations. Plant breeders in private industry worked primarily with corn and sorghum, the commercial product of which is hybrids, with some breeding effort of alfalfa, cotton, sugar beets and certain vegetables. There was little incentive to invest in plant breeding of non-hybrid crops because a private company would receive a sales benefit in only the first year after releasing a new variety. After the release of a non-hybrid crop, anyone could grow, increase and sell seeds of that new variety the following season. Because new variety development could take from 10 to 20 years, it was economically unreasonable to invest in private plant breeding research programs without plant protection.

Private industry sought greater financial returns, because of increased investment in development of new varieties.

In 1970, the Plant Variety Protection Act (PVPA)[20] was enacted into law. The purpose of the PVPA was to encourage the development of novel, sexually reproduced plants by providing protection to plant breeders.[21] "Certificates of plant variety protection" were issued to the developers of novel, sexually reproduced varieties which gave the developer the exclusive right to sell, reproduce, import or export such varieties for a period of 17 years. Plant variety protection certificates are directed to any sexually reproduced plant except fungi, bacteria and hybrids. Congress believed that this grant would provide an economic incentive for private companies to undertake the costs and risks inherent in producing new varieties and hybrids.[22]

Prior to the PVPA, plant breeders were limited to protection of asexually reproduced plants under the 1930 Plant Patent Act.[23] By 1970, the benefits of the PPA were well recognized.[24] In addition, plant variety protection had been adopted in most European countries.[25] The PVPA was enacted following an unsuccessful attempt to amend the PPA in 1968 to include sexually reproduced plants. The primary reason for the unsuccessful attempt was the action of a highly successful plant breeding company which marshalled significant support against the amendment. This

company's primary concern was that the PPA worked well for it and it did not want to see the PPA changed.[26]

During hearings for the 1970 PVPA, the following expected benefits for the United States were identified by the American Seed Trade Association (ASTA), which pushed for the legislation.[27] According to ASTA, the Act would:

(1) greatly stimulate private plant breeding research;

(2) allow an increased focus on needed basic research by agricultural experiment stations;

(3) give more choice and better varieties to farmers and gardeners;

(4) make American agricultural products more competitive in world markets; and

(5) provide improved quality and quantity of varieties to consumers.

Amendments to the 1970 PVPA enacted in 1980 added protection for six vegetable crops.[28] These crops were specifically excluded in the 1970 PVPA because of opposition raised by two large food processing companies which feared an increase in the price of these vegetables. By 1980, these companies realized their fears were unfounded and no longer opposed protection of these vegetable crops.[29] Additionally, protection for a variety was extended from 17 to 18 years. The protection was extended to 18 years so that the PVPA would be consistent with UPOV to which the United States was considering

acceding and which provided 18 years as the minimum term for the protection of woody plants.[30]

Although few concerns were raised in 1970 when the PVPA was originally enacted, several concerns were raised during the hearings of the 1980 amendments. These concerns were that: (1) the patenting process might encourage the loss of genetic material; (2) the patenting process might encourage the acquisition of seed companies by larger corporations; (3) the patenting process would discourage the free exchange of information and materials; and (4) the rising cost of seed might be accelerated by the patenting process.[31]

A number of these concerns were addressed in a 1985 monograph entitled, The Impacts of Patent Protection on the U.S. Seed Industry and Public Plant Breeding.[32] The major conclusions of this monograph were:

(1) the PVPA had stimulated the development of new varieties of soybeans and wheat;

(2) there was little evidence the PVPA had significantly impacted public plant breeding;

(3) the PVPA had contributed to a number of mergers involving seed companies in the 1970's but was less important as an incentive to merge than the desire for diversification;

(4) the PVPA had contributed to seed price increases, but those increases were not considered unreasonable or unjustified;

(5) the PVPA had probably reduced the flow and exchange of information and germplasm from private companies to universities and had

increased the flow from universities to private plant breeders;

(6) it was not possible to draw any conclusions regarding the impact of the PVPA on the genetic diversity of crops; and

(7) the PVPA had resulted in modest private and public benefits at modest cost to both the public and private sectors.

Between the years 1970 and 1987, approximately 2,110 applications for plant variety protection certificates were filed for some 100 different crops. In 1987, 1,850 certificates had been issued, and 260 applications were still pending.

Utility Patents

The Constitution grants Congress broad power to legislate to "promote the Progress of Science and the useful Arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Art. I, § 8. In exercising this authority, Congress passed the first patent act in 1790. In the subsequent act, the Patent Act of 1793 authored by Thomas Jefferson, statutory subject matter was defined as "any new and useful art, machine, manufacture or composition of matter or any new or useful improvement [thereof]."[33] The 1793 Act apparently embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement."[34] Subsequent patent statutes were enacted in 1836, 1870 and 1874, which employed the same broad

language as the 1793 Act. The Patent Act of 1952 replaced "art" with "process" as patentable subject matter (35 U.S.C. § 101). The Committee Reports accompanying the 1952 Act demonstrated that Congress intended patentable subject matter to include "anything under the sun that is made by man."[35] However, the Supreme Court has held that laws of nature, physical phenomena and abstract ideas are not patentable.[36]

The issue of patentability of living organisms was raised in the case of Diamond, Commr. Pats. v. Chakrabarty, 447 U.S. 303 (1980). The living organisms then under consideration were clearly man-made microorganisms and were not products of nature. In a 5-4 landmark decision, the Supreme Court held that microorganisms were patentable subject matter under 35 U.S.C. § 101. In reaching that decision, the Court analyzed the legislative history of the statute and concluded that the use of the expansive terms "manufacture" and "composition of matter," and the use of the comprehensive term "any" demonstrated that Congress plainly contemplated a wide scope for the patent laws.[37]

As to the argument that the 1930 PPA and the 1970 PVPA demonstrated congressional intent to exclude living things from patentable subject matter, the court concluded that:

> (1) Congress had addressed the concerns that plants were (a) not patentable because they were products of nature, and (b) not amenable to the written description requirement of the patent law in enacting the 1930 PPA;[38]

(2) Congress believed that the work of a plant breeder in aid of nature was a patentable invention.[39]

(3) Congress relaxed the description requirement of 35 U.S.C. § 162 to be as complete as reasonably possible;

(4) No Committee or a member of Congress expressed the view that the 1930 PPA was necessary, since the terms "manufacture" or "composition of matter" excluded living things;[40]

(5) The PVPA was necessary since sexually reproduced plants were not included under the 1930 PPA;

(6) Sexually reproduced plants were included in the 1970 PVPA because it was generally recognized by 1970 that true-to-type reproduction was then possible for plant varieties,[41] and

(7) The legislative history did not suggest that the 1970 PVPA was enacted because living things were excluded from patentable subject matter.

The dissenting opinion opposed the patentability of living things and concluded that the 1930 PPA and the 1970 PVPA evidenced Congress' understanding, at least from 1930, that living things were not patentable subject matter. The dissenters reasoned that if living things were patentable, then "the plants included in the scope of the 1930 [PPA] and 1970 [PVPA] Acts could have been patented without new legislation.[42] The dissent noted that the Committee Reports for the 1970 PVPA contained excessive prose about the benefits of extending patent protection to sexually reproduced plants.[43] Thus, the dissent concluded that the enactment of the 1930 PPA and the 1970 PVPA clearly

demonstrated that Congress did not consider living things to be patentable under 35 U.S.C. § 101.

Although Chakrabarty held that living things, namely microorganisms, were patentable, the specific issue of whether plants and varieties are patentable subject matter was not addressed by the Supreme Court. That issue was addressed by the Board of Patent Appeals and Interferences ("the Board") in Ex parte Hibberd, 227 U.S.P.Q. 443 (1985). The case contained claims directed to plants, seeds, tissue culture, hybrid plants and hybrid seeds in which the claims to the hybrid plants and seeds had been allowed, and the remainder rejected by the Patent Office examiner. The examiner asserted that although man-made life forms, and hence plants, were patentable under § 101 in view of Chakrabarty, plants were excluded from patent protection by the enactment of the 1930 PPA and the 1970 PVPA. The examiner also asserted that those Acts set forth how and under what conditions plant life covered by those Acts should be protected. In other words, the examiner asserted that the 1930 PPA and the 1970 PVPA were the exclusive forms of protection of the plant life specified in those Acts.[44]

The Board disagreed with the examiner and held that plants and varieties could be protected by a utility patent. The Board approached the issue as a question of statutory construction, i.e., whether 35 U.S.C. § 101 had

been restricted or narrowed by the enactment of the 1930 PPA and the 1970 PVPA. Following the Supreme Court in Chakrabarty, the Board found no explicit or implicit restriction of the scope of § 101 in either of the Acts or in their legislative histories.[45] The Board relied on Supreme Court precedent[46] which held that (a) a repeal or narrowing by implication are not favored, and (b) both of two acts on the same subject are given effect if possible. There must be a positive repugnancy or irreconcilable conflict in order to find that the two acts cannot coexist. The Board could not find any irreconcilable conflict, and held that the differences between the Patent Act and the PPA and PVPA (research and farmer's exemptions, compulsory licensing, single claim, single variety and asexual reproduction[47]) were not irreconcilable. The Board also noted that the availability of one form of statutory protection does not preclude the availability of protection under another form.[48]

Finally, in dismissing the examiner's argument that extending patent protection to plants would violate Article 2 of the UPOV (Union for the Protection of New Varieties of Plants),[49] the Board concluded that a valid enactment, such as 35 U.S.C. § 101, overrides conflicting provisions of an international executive agreement, i.e., the UPOV.[50] Thus, the Board concluded that plants and plant varieties were

patentable subject matter under 35 U.S.C. § 101. However, it should be noted that the issue of patentability of plants has not been decided by any court.

INTERNATIONAL INTELLECTUAL PROPERTY PROTECTION FOR PLANTS[51]

Plant Variety Protection

In 1961 the Paris Convention established the UPOV to develop some uniformity of breeders' rights. The purpose of the Convention was "to recognize and to ensure to the breeder of a new plant variety ... the right to a special title of protection or of a patent."[52] The UPOV's goal was to provide a model for the adoption of breeders' rights statutes by individual countries. Those countries which desired to provide breeders' rights could model their statutes after UPOV and could join the convention to enjoy the reciprocity between countries provided by it.

According to the revised text of the Convention of October 23, 1978, the UPOV is an intergovernmental organization with 17 member countries.[53] Both sexually reproduced and vegetatively propagated (i.e., asexually reproduced) plants can be protected under the Convention as determined by the individual members.[54] In order to obtain protection in each member country, it is necessary to file a separate application in each country. There is no central filing system and no international protection

available by filing in only one member country. A breeder who develops a new variety has an exclusive right to produce and sell that variety. The tests for a new variety, i.e., distinctiveness and uniformity, can be determined by official field trials. The field trials lengthen the time required for processing applications.

The UPOV Convention requires that each variety to be protected must have a specific, unique name which is used in marketing the variety. The Convention provides that either plant variety protection or patent protection be available for a new variety. This provision was waived for countries such as the United States, which had other forms of protection available before it acceded to the Convention.[55]

Plant variety protection is strong in the European countries. In most of those countries, the only varieties that can be protected under breeder's rights statutes are those specifically set forth in varietal lists compiled for each individual country. These lists, periodically updated, include sexually reproduced plants (e.g., corn, wheat and sorghum), asexually reproduced plants (e.g., roses, peach trees and lilies), and trees and woody plants (e.g., poplar, firethorn and elm). The varieties are protected for 15 to 30 years (generally 20 to 25 years)[56] from the issue date of the certificate or "patent."[57] The scope of protection granted is quite broad and includes the

right to exclude others from producing, selling and making hybrids from the variety, and extends to the whole plant or any plant part. Most countries permit the use of the variety for developing new varieties. In addition, some European countries have mandatory (compulsory) licensing which permits an individual or organization access to a variety upon payment of a "reasonable" royalty fee to the breeder. In compulsory licensing, the patent or certificate owner must grant a license.

Argentina, although not a member of the UPOV, has enacted plant variety protection. The 10-20 year right applies to the seeds, fruits, bulbs, tubers, buds, and graftings of the new variety.

Australia, currently not a member of UPOV, offers a 20-year certificate for plant variety protection which is not currently available because the applicable plant genera or species are yet to be identified. However, the rights are so restrictive that they limit the potential usefulness of plant variety protection. For example, all rights are lost if the variety is sold prior to registration, i.e., during the application stage.

Although the U.S.S.R. also is not a member of the UPOV, protection there is available for new varieties and hybrids of agricultural crops and other cultivated plants through an Inventor's Certificate. All rights of the Inventor's Certificate vest in the State.

Major grain-producing countries which do not have specific plant variety protection include Brazil, Canada, China, India, and the Philippines.

Utility Patents

Protection of plants by utility patents varies more widely between countries than plant variety protection. Many countries, specifically Argentina, Brazil, Canada, China, India, the Philippines and the U.S.S.R., do not grant utility patents for plants, varieties or hybrids.[58] Argentina's law does not specifically exclude living things, but its examiners have taken the position that living things are not considered patentable.[59] The patentability of plants in Canada is currently on appeal in a case involving a patent application drawn to a soybean produced by cross-breeding.[60]

The European Patent Convention (EPC) established on December 7, 1977 in the European Patent Office (EPO) the power to grant patents. A single European patent application can be directed toward any or all member countries in the EPC, thus eliminating the time and cost of filing in each country.[61] Many provisions of the national patent laws have been brought into conformance with the EPC. However, if a conflict arises between a member country's patent laws and the EPC, the member country's laws would control.

According to the EPC, essentially biological processes and specific plant varieties, regardless of whether they were produced by breeding or genetic engineering, are not patentable.[62] Although plant varieties are specifically excluded, there is no general exclusion for plants. According to the Technical Board of Appeal of the EPO, EPC Article 53(b) prohibits only the patenting of plants which are in the genetically fixed form of a plant variety, i.e., a specific variety such as the rose "Peace" or the wheat cultivar "Chinese Spring."[63] Thus, the EPO will grant utility patent (generic) protection for plants, for example, where a gene has been inserted into a plant, e.g., corn having gene X, but is not fixed in a single plant variety, e.g., corn inbred A having gene X. Similarly, a process for transforming a plant to insert a desired gene would be patentable because human intervention played a greater role in the final result than biological forces. This viewpoint has been adopted by the Swiss Patent Office.[64]

EPC member countries have national patent laws which can be used in place of an EPC filing. Often the individual national laws parallel those of the EPC, so that there is no significant difference as to patentability between the choice of routes. Representative countries include England and Switzerland. The national patent laws of some countries, such as Austria and Luxembourg,

specifically exclude plant varieties as patentable subject matter.[65] Finally, several countries, including France and Germany, permit the patenting of plant varieties which are not subject matter of the specific plant variety laws of the country.[66] In those instances, general rules of patentability usually apply. For example, in Germany, the plant variety must be new, must constitute an inventive step[67] and must be sufficiently disclosed for repeated reproduction. This latter requirement would prevent the patentability of many plants except possibly those in which a new gene had been inserted. A deposit of seeds or plants has not yet been accepted as a means of satisfying the reproducibility requirement. The term of the patent is generally 20 years from the application filing date.

As with France and Germany, the Australian patent act is sufficiently broad to include inventions relating to plants. The term of the patent is 16 years from the application filing date. A patent to a plant in Australia would encounter the same difficulty as in Germany, i.e., satisfying the requirement for reproducibility.

Japan has been granting patents for plants and processes of producing plants. Prior to 1970, an invention relating to the production of plants, e.g., a method for cultivating mushrooms or a method for blooming irises, could be patented in Japan. Plants per se were not believed patentable because they were considered neither an

invention nor to be reproducible. In 1970, the Japanese Patent Office set up a new examination standard and began granting patents on plants per se, provided the plant was an artificially cultivated one, and one which belonged to a group having characteristic features which would differentiate it from all other groups.

International Comparison of Intellectual Property Protection for Plants

Intellectual property protection for plants and varieties is rather limited in countries other than the United States. In the United States, plants (sexually reproduced and asexually reproduced), plant varieties and hybrids can be protected by utility patents. The description and enablement requirements can be satisfied by depositing seed or plants where applicable.[68] Utility patent protection for generic plants is available in Japan. Deposits of seed or plants also appear to satisfy the description and reproducibility requirements. Several countries, including Australia, France and Germany, provide utility patent protection for plants not specifically covered by plant variety protection. However, the reproducibility requirement in those countries cannot be met for most plants except possibly for the introduction of new genes. Under the EPC, a utility patent can be obtained for plants which are not a specific variety. It appears that a deposit of seeds or plants would satisfy the

reproducibility requirement in the EPO. However, no case has been reported in which a deposit of seeds was held to satisfy the reproducibility requirement.[69]

The European countries, Argentina, Japan and the United States all have plant variety protection which is available to specific plant varieties. In the United States, the protection is limited to sexually reproduced plants while in other countries, asexually reproduced plants including trees are also included. In the United States, protection of asexually reproduced plants is obtained by plant patents as well as utility patents. In all countries, protection of plant varieties by plant variety protection does not exclude a third party from using the variety to develop a new variety. In the U.S.S.R., plant varieties can only be protected by an Inventor's Certificate which vests all rights in the State.

Significant agricultural producing countries such as Brazil, Canada, China, India and the Philippines do not currently have any statutory type of protection available to plants or plant varieties.

FEDERAL STATUTORY PROTECTION FOR PLANTS

As previously discussed, plant patents, plant variety certificates and utility patents are currently available for the protection of plants in the United States. A

detailed analysis of the provisions contained in the three relevant Federal statutes follows.

The Plant Patent Act

Rationale for Adoption

The Plant Patent Act (PPA) was enacted by Congress "to afford agriculture, so far as practicable, the same opportunity to participate in the benefits of the patent system as has been given industry, and thus assist in placing agriculture on a basis of economic equality with industry. The bill will remove the existing discrimination between plant developers and industrial inventors."[70] The PPA was enacted to provide "an incentive to asexually reproduce new varieties", an "incentive to preserve new varieties"[71] and an incentive "for stimulating plant breeding and consequently stimulate plant development through private funds."[72] Finally, the intent of the PPA was to unleash the genius of young agriculturists in the United States to "revolutionize agriculture" by enlisting them in a profitable work of invention.[73]

It was expected that the PPA would benefit the plant breeder by enabling him to obtain compensation for the plant variety through the life of the plant patent. The public would benefit because new varieties would be more readily available and would be available at a lower price.[74] The PPA was also viewed as an important factor in

maintaining public health and in promoting public safety and national defense, through an improved food supply, discovery of medicinal plants and development of substitutes for natural rubber.[75] The realization of the expectations of the PPA benefits was noted during the consideration of the PVPA.[76]

Applicability and Scope of Protection

A plant patent provides for the protection of "any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in the uncultivated state" to "whoever invents or discovers and asexually reproduces [the plant]."[77] Although plants found in an uncultivated state are not subject to protection by a plant patent, a plant seedling in a cultivated state which is discovered and asexually reproduced is protectable. A plant in an uncultivated state refers to a wild variety, a plant existing in nature, for which protection is not available under the PPA to the discoverer of the plant. A plant seedling, a plant in a cultivated state, however, has arisen by the action of the plant grower, and thus protection is available under the PPA.[78] Sexually reproduced plants cannot be protected by the PPA. Asexual reproduction was viewed as the only method to insure the production of an identical plant.[79] Protection under the

PPA is directed to only a single variety, e.g., the rose "Peace", and not a group of varieties having a common trait, e.g., a rose having white flowers. PPA protection grants the patent owner the right to exclude others from asexually reproducing the plant or selling or using a plant so reproduced. A major disadvantage in plant patent protection is that such protection does not extend to plant parts, flowers, fruit, cuttings and the like which may be the commercial embodiment of the variety but which would not be capable of asexually reproducing the plant.[80] In order to be patentable, the plant must be new, distinct, nonobvious[81] and asexually reproduced. To be distinctive, the plant variety "must have characteristics clearly distinguishable from those of existing varieties."[82] In order to be new, the variety must not have existed before, e.g. must not have (a) been known before the date of the invention (discovery) or more than one year before the filing date of the application, or (b) been in public use or sold or offered for sale more than one year before the application date.[83] In addition to being new, distinct and nonobvious, the new variety must be adequately and completely described. The description for a plant patent can be less than that required for a utility patent as long as "the description is as complete as reasonably possible."[84] It is unlikely that the description would be so complete as to enable a skilled artisan to make (i.e.,

reproduce) the new variety without the benefit of the patented variety. For this reason, asexual reproduction was made a requirement of the right to a plant patent. Likewise, the purpose of the description was to enable identification of the new variety for the purposes of determining infringement.[85] A deposit is not required under the PPA.

Judicial Interpretation

The mere existence of a variety which had been asexually reproduced is not sufficient to prohibit patentability of a plant variety if (a) the distinctive characteristics of the variety and its value were not appreciated by anyone prior to the discovery by the inventor or (b) no one had known of the existence of the variety.[86] This finding was followed in Yoder Brothers, Inc. v. California-Florida Plant Corp. et al.,[87] involving a chrysanthemum. In Yoder Brothers, the court said, "the whole key to the 'invention' of a new plant is the discovery of new traits plus the foresight and appreciation to take the step of asexual reproduction."[88] The court in Yoder Brothers also determined that the requirement of distinctness for plants essentially replaced the requirements of utility and non-obviousness of utility patents.[89]

In Yoder Brothers, the court concluded that infringement under the PPA was (a) the asexual reproduction of a patented plant or (b) selling a plant so reproduced or (c) using a plant so reproduced.[90] The court held that it was not necessary to show production of the whole plant and that the taking of plant material or cuttings was sufficient to find infringement.

In Pan-American Plant Company v. Matsui,[91] involving a chrysanthemum, the court set forth the list of characteristics which could distinguish two varieties. This list was originally set forth in the legislative history of the PPA.[92] In this case, the patent owner destroyed a plant for which a patent was later issued and which was not disease-resistant. The plant patent owner substituted a disease-resistant variety developed by a third party in a mutational event similar to the patented plant. This disease-resistant variety was marked with the number of the "patented" plant. The court concluded that the replacement plant was not the patented plant based on the disease-resistance characteristic not being specified in the plant patent.

In determining infringement, a court will consider the characteristics of the alleged infringing variety and the description in the plant patent. If there is no match, infringement will not be found. For example, in Kim Brothers v. Hagler,[93] the court concluded that the size and

color of the allegedly infringing nectarines were not the same as the size and color of the patented nectarines described and shown in the plant patent. In addition, a court requires a showing of an asexual reproduction of the patented plant, i.e., a physical appropriation from one of the patented plants.[94] When asexual reproduction has been established, a finding of infringement will result. See Armstrong Nurseries Inc. v. Smith et al..[95] In Armstrong Nurseries, the court found infringement as a result of (a) the asexual reproduction of the patented roses and (b) the sale of the asexually reproduced plants. The court also held that providing of material for asexual reproduction was an active induction to infringe and that assisting in the sale of the roses was a contributory infringement.

The Plant Variety Protection Act

Rationale for Adoption

The Plant Variety Protection Act (PVPA) was enacted by Congress "to encourage the development of novel varieties of sexually reproduced plants and to make them available to the public, providing protection available to those who breed, develop, or discover them, and thereby promoting progress in agriculture."[96] The PVPA provides an incentive for private enterprise to invest in research and

development for the production of new and better sexually reproduced varieties.

During the hearings leading to the enactment of the PVPA, the view was expressed that patent protection did not extend to sexually reproduced plant varieties. The Senate Judiciary Committee Report states: "Under the patent law, patent protection is limited to those varieties of plants which reproduce asexually, that is, by such methods as grafting or budding. No protection is available to those varieties of plants which reproduce sexually, that is, generally by seeds."[97] This view was also expressed by Representative Poage who noted the protection accorded asexually reproduced plants and stated that "for plants produced from seed, there has been no such protection."[98] Thus, another rationale of the PVPA was to provide legal protection for sexually reproduced plant varieties, a class for which legal protection had not previously been available.[99] The PVPA was enacted in 1970 following an unsuccessful attempt in 1968 to amend the PPA to include sexually reproducing plants.[100]

In a 1970 House of Representatives Hearing it was noted that a number of European countries had developed a convention[101] in 1961 to provide national breeders' rights. Most European countries had laws offering legal protection to plant breeders, but U.S. plant breeders had no law protecting their innovations except in the limited area of

asexually reproduced plants covered by the 1930 Plant Protection Act. This fact caused concern that the American breeder and American agriculture would be disadvantaged in the international marketing of seed and in the food, feed and fiber crops produced therefrom. The PVPA was expected to greatly stimulate private plant breeding, to make American agricultural products more competitive in the world marketplace and provide better quality and quantity of products to the consumer. These expectations were based on the benefits of plant variety protection in Europe, which played a major role in the adoption of the PVPA. In addition, the positive effects of the PPA in stimulating private plant breeding of asexually reproduced plants would be extended to sexually reproduced plants.[102] The expectations of the PVPA benefits have been realized as noted by Butler & Marion, Dr. Caldwell, infra and Mr. Dunner.[103]

The American Seed Trade Association supported the bill leading to the PVPA "because of a profound belief that this legislation will benefit not only plant breeders but will bestow even greater benefits on American agriculture and the community at large."[104] In a 1980 Senate hearing, Dr. Billy E. Caldwell, Head of the Crop Science Department, North Carolina State University, stated that "The Act [PVPA] has benefited the grower and consumer through improved varieties that have been quality [sic]; are more

productive; and contain resistance to an ever-increasing number of pests that attack our crops."[105]

The PVPA gave developers of novel varieties exclusive rights to the varieties for 17 years. The 1980 amendments to this Act extended protection from 17 to 18 years to be consistent with the minimum term of protection set by UPOV.

Applicability and Scope of Protection

A plant variety protection certificate provides for the protection of "any novel variety of sexually reproduced plant (other than fungi, bacteria or first generation hybrids)."[106]

Asexually reproduced plants and hybrids cannot be protected by the PVPA. The protection extends only to a single variety and not to a group of varieties having a common trait. PVPA protection grants the certificate owner the right to exclude others from selling, offering for sale, delivering, importing, exporting, sexually multiplying the variety, producing a hybrid from the variety, using seed or progeny of variety to propagate the variety and dispensing the variety without notice.[107] The Secretary of Agriculture can require the certificate owner to grant licenses to third parties (compulsory licenses) if it is in the public interest.[108]

This grant, however, does not include the right to exclude others from using the protected variety to develop

new varieties. A farmer's exemption is also provided.[109] According to this exemption, it is not an infringement for a person whose primary farming occupation is the growing of crops for sale for other than reproductive purposes to save seed and use that seed in the production of a crop on his farm or for sale to a person whose primary farming occupation is the same as his own. Plant variety protection is granted for a period of 18 years from the issue date of the certificate, and also available for the time between distribution of the variety with a proper notice and the issue date of the certificate.[110] The application for a PVP certificate is maintained in confidence although the variety name, applicant, and filing date is published.[111]

In order to be protectable under PVPA, a variety must be novel, uniform, distinctive and stable.[112] In order to be new, the variety must not have been a public variety or available in this country or adequately described by a publication before the date of determination or more than one year before the filing date.[113]

To qualify as uniform, any variations in the variety must be predictable and describable.[114] In order to be distinctive, the variety must differ from all other varieties by one or more characteristics.[115] The variety is stable if it remains unchanged when sexually reproduced.[116]

Judicial Interpretation

The farmer's exemption is the only provision of the PVPA which has been subjected to judicial interpretation. In Delta and Pine Land Co. v. Peoples Gin Co.,[117] the only reported case concerning infringement under the PVPA, the court concluded that the farmer's exemption did not apply to either a non-profit agricultural cooperative which arranged sales of a protected variety or to a company which dispensed the protected variety without giving notice that it was protected. The court believed that the intervention of a third party to act as a broker or sales agent would frustrate the basic purpose of the PVPA because the third party was larger in size than a single farmer and would be more aggressive. After concluding that the farmer's exemption did not apply, the court concluded that there was infringement because the variety (1) had been (a) sold, delivered, etc. (7 U.S.C. § 2541(1)), (b) dispensed without notice of it being protected (7 U.S.C. § 2541(6)) and (2) these actions were instigated or actively induced (7 U.S.C. § 2541(8)).

A second case, Asgrow Seed Co. v. Kunkle Seed Co., Inc. et al,[118] which is currently on appeal to the Court of Appeals for the Federal Circuit (CAFC) also involves the farmer's exemption. The plaintiff has appealed the district court's refusal not to grant a preliminary injunction to prevent the sale of seed of a protected

variety of soybeans. The issue is whether the primary farming occupation of the defendant is the growing of crops for sale for other than reproductive purposes. The district court based its decision on the fact that less than half of the total volume of seed produced by the defendant was sold for reproductive purposes. The plaintiff alleges that the defendant's primary occupation is to sell seed, as evidenced by its (a) sale of 1.42 million pounds of the specific protected seed (not including additional public varieties which were sold), (b) increasing the acreage to grow such seed, and (c) intent to sell as much seed as possible, even though less than half of the farm income came from the sale of the specific protected seed.

Utility Patents

Rationale for Adoption

The utility patent statutes were enacted to promote the progress in the useful arts by granting inventors the exclusive right to their discoveries.[119] This purpose is embodied in 35 U.S.C.§ 101 which was intended to "include anything under the sun that is made by man."[120] The Supreme Court has interpreted § 101 to include living things as a manufacture or composition of matter[121] and the Board of Patent Appeals and Interferences has interpreted

§ 101 to include plants as a manufacture or composition of matter.[122]

Applicability and Scope of Protection

Utility patents provide protection to "any new and useful manufacture, or composition of matter or any new and useful improvement thereof"[123] which, in accordance with the Chakrabarty and Hibberd cases, includes plants, plant varieties, plant parts (e.g., fruit and flowers), processes of producing plants, plant genes and hybrids. A utility patent grants the patent owner the right to exclude others from making, using or selling the patented invention. The term of a patent is 17 years from the issue date, during which protection is available, as long as the patent is maintained in force.[124] A patent application is maintained in secrecy by the Patent and Trademark Office, and is not public until it issues.

In order to be patentable, the plant or variety must be new, useful and nonobvious. In order to be new, the invention must not have previously existed as set forth in 35 U.S.C. § 102.[125] In order to be nonobvious, the plant or variety must not be an obvious variation from the prior art (patents and other references) to a skilled artisan.[126] The issue of nonobviousness in utility patents for plants has not been specifically addressed. However, it is likely that the criteria of distinctness for plant patents and PVP

certificates would be used to determine obviousness for a utility patent.

An additional requirement for obtaining a utility patent for a plant is that the invention must be described in such a manner so to enable anyone to make and use the invention.[127] This requirement probably cannot be met for plants, varieties or hybrids by a simple description. In those instances, it will be necessary to make a deposit in a public depository of the seed which then will be available to the public after the patent issues.[128]

COMPARISON OF VARIOUS STATUTES AND OTHER FORMS OF INTELLECTUAL PROPERTY

The Plant Patent Act (PPA) was enacted in 1930 to provide rights to plant breeders and horticulturists who discover or develop new and distinct plant varieties and propagate them by asexual reproduction. The Plant Variety Protection Act (PVPA) was enacted in 1970 to provide rights to plant breeders who discover or develop new, uniform, stable and distinctive plant varieties which are propagated by sexual reproduction. The PPA and PVPA function to complement one another in providing protection for genetically stable, and therefore reliably describable, new varieties of plants - asexually reproduced via PPA and sexually reproduced via PVPA.

Utility patent protection subsequent to Ex parte Hibberd provides protection for plants including asexually

reproduced plants such as those included within the PPA, sexually reproduced plants such as those included within the PVPA, plant parts (e.g., flowers, fruits and nuts) which are excluded from the PPA, and hybrids, seeds, genes and plants with defined physical traits. Thus, the utility patent (when its requirements can be satisfied) offers broader coverage for the same plant than would be available under either the PPA or the PVPA.

Plant Patents vs. Utility Patents

The advantages of obtaining a utility patent for an asexually reproduced plant are many. A utility patent is not limited to one claim as is a plant patent. The utility patent can cover plant parts including flowers, nuts, fruit and other cuttings which do not asexually produce a plant-probably the single most significant advantage of the utility patent. There is no requirement that an infringing plant be produced asexually from the patented plant so that sexual reproduction will also be covered by the utility patent. In addition, a utility patent excludes others from making the same plant variety. The utility patent can protect a plant having an inserted gene, rather than a single variety containing that gene.

One disadvantage of a utility patent is that the description requirement is more stringent than that required for a plant patent. In order to satisfy that

description requirement, it will be necessary to place the plant or seed on deposit, thus making it freely available to the public. Therefore, a more rigorous policing effort will be required to prevent infringement of the utility patent. One additional disadvantage is that the government fees for obtaining and maintaining a utility patent are higher than for a plant patent.

Plant Variety Protection Certificates vs. Utility Patents

The advantages of obtaining a utility patent for a sexually reproduced plant are many. A utility patent is not limited to the specific variety described. The utility patent can protect the specific variety as well as hybrids made from that variety. A utility patent can also protect the plant, seed, plant parts, genes, plants having a specific physical trait, and processes for developing new varieties and hybrids. Hybrids are specifically excluded from plant variety protection. This extensive scope of coverage for a utility patent is a significant advantage over plant variety protection. A second significant advantage is that there is no farmer's exemption under the utility patent statutes. Consequently, it would be an infringement of a utility patent for anyone other than the patent owner or his licensees to sell the seed. Another advantage in protecting a plant or plant variety by a utility patent is that it would be an infringement of the

utility patent to use the patented plant or variety in developing a new variety or hybrid. A final advantage is that compulsory licensing cannot be mandated for a utility patent. In compulsory licensing, the patent or certificate owner must grant a license to a third party. The owner will receive a reasonable royalty but he does not have any option other than granting the license. Compulsory licenses can be mandated under the PVPA if the Secretary of Agriculture determines it to be in the public interest.

A disadvantage to utility patents for plants and plant varieties is the stringent description requirement which necessitates the deposit of the plant or seed. This deposit is publicly available when the patent issues. Although the PVPA requires a seed deposit, the present policy of the Plant Variety Protection Office is that the deposited seed is not available to the general public.[129] A second advantage of plant variety protection is that protection is afforded to the new variety before the issuance of the certificate at the time that the seed is dispensed with a proper notice. A further advantage is that the government fees and deposit fees would be higher for a utility patent.

A comparison of the features of a plant variety certificate and a utility patent is shown in the following Table.

TABLE

A Brief Comparison of U.S. Plant Variety Protection Certificates and Utility Patents for Plants

The following table summarizes PVPA certificates and plant utility patents.

	Plant Variety Protection Certificates	Utility Patents for Plants
Requirements:	Novelty, uniformity, distinctiveness, Novelty: new, has not previously been known publicly Uniformity: any variations are describable, predictable Stability: remains unchanged when sexually reproduced Distinctiveness: differs by one or more characteristics	Novelty, utility, non-obviousness Novelty: new, has not previously been known publicly Utility: usefulness for other than research purposes Non-Obviousness: not an obvious variation of the known art
Scope of Available Protection	Seed of described inbred or variety; "any novel variety of sexually reproduced plant, other than fungi, bacteria, or first generation hybrids"	Seeds, plants, plant parts, genes or physical traits for inbreds, hybrids and varieties; methods of developing inbreds, hybrids and varieties; methods of plant regeneration
No. Years Protection	18 years from issue date of certificate	17 years from issue date of patent

	Plant Variety Protection Certificates	Utility Patents for Plants
Right to:	Exclude others from selling, importing, exporting, reproducing, etc., for term of certificate plus time period from distribution of variety with proper notice to issue date	Exclude others from making, using or selling for term of patent
Seed Deposit	Seed deposit is not accessible by others according to present Plant Variety Protection Office policy	Seed deposit is accessible, but patent owner can be notified of who received seed. Seed can be used for research only and not to develop new commercial products without permission (license) from patentee
Compulsory Licensing	None, except if Secretary of Agriculture determines to be in public interest	None
Cost	Govt. fee of $2,000 per application plus cost of preparation and amendment (if any)	Govt. fee of $500-$1,000 plus cost of preparation and amendment (if any) plus maintenance fees at 3½, 7½ and 11½ years from issue date
Business Restrictions	Can use protected inbred/variety to develop new inbreds, varieties & hybrids; farmer's exemption	Will protect multiple inbreds, hybrids or varieties having patented characteristic so newly developed inbred/variety will be covered; seed can be used for basic research but not to develop commercial products without permission (license) from patentee; no farmer's exemption

Trade Secret Law

Trade secrets are the subject of state law. There are many accepted definitions of a trade secret. 4 Restatement of Torts § 757, comment b at 5 (1939), gives the following definition:

> "A trade secret may consist of a formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers."

According to this definition, a trade secret is anything that gives a company a competitive advantage. The theft of a trade secret is a tort and action lies against the "thief" for misappropriation. It is not considered a misappropriation if one obtained trade secret information from a third party and did not know that such information was a trade secret. However, the trade secret owner has an actionable cause against the third party for wrongful disclosure of the trade secret.

Trade secret law in the United States has been fashioned to promote two doctrines. It encourages commercial morality and fair-dealing, and it encourages research and innovation.

In Kewanee Oil v. Bicron Corp.,[130] the Supreme Court found trade secret law to be compatible with patent law, stating that:

"Certainly the patent policy of encouraging invention is not disturbed by the existence of another form of incentive to invention. In this respect the two systems are not and never would be in conflict."

In support of its decision in Kewanee, the Court in 1979 held in Aaronson v. Quick Point Pencil Co.[131] that a contract for royalties on a product found to be unpatentable was enforceable. The Court was seeking to (a) prevent the suppression from the market of innovative products which do not achieve the level of patentability, and (b) thereby encourage trade secret law where it is not inconsistent with the aims of the patent system. Quick Point Pencil Co. had placed great value on an innovation disclosed to it in confidence and paid for the right to be the first in the marketplace, knowing that a patent might not issue.

Trade secret rights require that a trade secret be disclosed in confidence only to employees or officers of the company having legal possession of the trade secret or to potential licensees of the trade secret. These rights require that measures be taken to prevent disclosure of the trade secret to the public or to competitors. Each company should specifically identify its trade secrets so that it will have enforceable rights. A person entering into a confidential relationship with a trade secret holder, therefore, must know what is a trade secret. If a trade

secret is disclosed in a non-confidential manner, it is lost forever.

Patent applications are considered trade secrets and non-disclosure rules apply during the pendency of an application. A member of the public must obtain permission from the owner of a patent application to obtain access to the file. Abandoned patent applications are similarly not generally available to the public, except under special circumstances. However, once a patent issues, the information contained in it is made available to the public, in order to encourage further innovation.

Plant patents and utility patents directed to plants and varieties provide protection to the owner for 17 years, and PVP certificates provide protection for 18 years, to allow the owner to profit from his contribution. Once a patent or PVP certificate issues, the disclosure becomes part of that patent or PVP certificate, and the information contained in it is made available to the public in order to encourage further innovation. At the time the patent or certificate issues, the material in the application is thus no longer a trade secret.

Trade secret rights can be protected in laboratories and factories where the movement of outsiders is confined and appropriate security is maintained. Plant varieties are, by their nature, ill-suited to protection by trade secret because they are not easily confined in an enclosed

space and are readily accessible to anyone, thus making them highly susceptible to theft by outsiders. A plant is easily grown from only a portion of its parent or from a seed. If someone obtains some seeds, plants from those seeds can be easily reproduced. Theft of the secret plant variety jeopardizes a producer's potential compensation for his investment of creative effort, as well as his chances of receiving private funding for his enterprise.

SURVEY OF UNIVERSITIES, SEED COMPANIES, NURSERIES AND BIOTECHNOLOGY COMPANIES

A questionnaire (Appendix C) was distributed to 54 biotechnology companies, seed industry companies, nurseries and universities. Responses have been received from 39 respondents, as identified in Appendix C. The questionnaire addresses the concerns and issues regarding intellectual property protection for plants and varieties in general and utility patents for plants and varieties in particular. The responses have been analyzed as described and recorded in Appendix B, which also contains the comments recorded on the surveys.

Based on overall response to the survey (column 1 of Survey II), there was strong agreement among the respondents that all four types of plant protection (plant variety protection certificates, utility patents, trade secrets and plant patents) have been or will be beneficial for their business/university (see questions 1 and 9), and

all four types of protection will provide an incentive to develop new varieties (question 3). A majority of the respondents wanted both plant variety protection and plant utility patent protection (questions 4 and 5), and expected that (plant) utility patents and other forms of plant protection would not interfere with the development of new varieties or inbreds (question 2). A high percentage of the respondents did not want compulsory licensing for new varieties/inbreds (question 6) and desired world-wide standardization of plant protection (question 7).

Looking specifically at companies who are primarily involved with biotechnology (column 2 of Survey II), there is a strong preference for plant utility patent protection (questions 1, 3, 5 and 9), and for no compulsory licensing.

The concerns and comments expressed by the biotechnology companies related to (1) the importance and significant benefits to everyone of utility patents for plants, (2) the desire for no change in the patentability of plants, and (3) the belief that compulsory licensing should not be required.

Seed company responses to the questionnaire (column 3 of Survey II) also indicated that all four types of protection provided an incentive to develop new varieties and had been beneficial for their business/university (question 3). Many of the seed companies expressed some concern regarding plant utility patents interfering in the

development of new varieties and inbreds (question 2b). Seed companies also expressed this concern by having a preference for compulsory licensing with plant utility patents (question 6b). Certain seed industry companies stated that a company having plant utility patents could refuse to license a new biotechnology or other plant development to competitive companies. On the other hand, the majority of the seed industry companies generally view the plant utility patents as having a beneficial affect on their business (question 1) and providing an incentive to develop new varieties (question 3b).

The concerns and comments expressed by the seed companies related to: (1) restriction of germplasm by utility patents on varieties, (2) the belief that plant variety protection would be sufficient if it were strengthened, (3) the view that a good data base for the Patent Office is necessary, and (4) a concern that large conglomerates with ready capital could dominate the industry.

Responses from universities (column 4 of Survey II) indicate less of a concern that plant utility patents would interfere with development of new varieties (question 2b) than responses from seed companies. University respondents generally perceived plant variety protection certificates, utility patents and plant patents as effective types of protection for universities (questions 9a, b, d). There

was less support for trade secret protection since universities are publicly funded institutions.

The concerns and comments expressed by universities related to: (1) benefits and disadvantages (especially to universities) of utility patents for plants; and (2) the belief that equal protection should be available for all forms of plant life.

Nurseries (column 5 of Survey II) are highly supportive of the 1930 Plant Patent Act which allows plant patents for asexually reproduced plants. Nurseries gave strong support for all forms of plant protection and standardizing plant protection world-wide. There was strong support against compulsory licensing.

The concerns and comments expressed by nurseries related to strengthening plant patent protection by protecting plant parts.

SUMMARY

The responses we have received to our survey concerning intellectual property protection for plants indicate a strong preference by both industry and universities for all types of intellectual pro≡erty protection for plants and varieties. Trade secrets are of value during the research and development stage. Utility patents, plant patents and plant variety certificates are strongly favored to reward the inventors and their

investors and thereby provide an incentive to invest in research to improve plants used for food, fiber, medicine and industry. It is significant that most segments of the industry and universities view plant utility patents very favorably. The neutral position by the seed companies on many of the answers reflects the differences in opinion between unaffiliated seed companies and seed companies affiliated with the chemical or pharmaceutical industry.

Biotechnology companies favor the protection provided by utility patents because it provides protection for plant parts, processes, genes and plants characterized by physical traits which may or may not be specifically identified with a given gene. The improved plant has been manipulated via biotechnology to produce the desired physical trait. Some companies are well aware of the role patents have played for nearly 200 years in stimulating invention and in recent years to stimulate research in plant biotechnology. A majority of the universities surveyed favored all kinds of intellectual property protection for all forms of plant life. Patenting provides additional funds for and stimulates research which is important to universities. Nurseries strongly support plant patents and protection for asexually reproduced plants. Nurseries favor utility patents because they provide protection to plant parts.

Many respondents viewed utility patents as (1) beneficial, (2) non-interfering with the development of new varieties, and (3) necessary to provide adequate protection for new varieties. The unaffiliated seed companies expressed the most concerns with utility patents. These concerns included (a) restriction of germplasm, (b) industry concentration, and (c) domination of the industry by large conglomerates. Some of the concerns expressed by these seed companies are the same as the concerns expressed by opponents of the PVPA during the hearings on the 1980 amendments to the PVPA.[132] The concerns expressed in 1980 have not materialized.[133] It is interesting to note that these concerns were not expressed by seed companies during the considerations of plant variety protection legislation in Congress. The concerns of these seed companies are probably derived from their concern about broad, generic patent protection.

Their concern in broad patent protection is reflected in the response of the seed companies to the question of compulsory licensing. The unaffiliated seed companies would prefer to have compulsory licensing for utility patents but are not as concerned about compulsory licensing of PVP certificates. It appears that these seed companies do not have as much difficulty with the concept of a restriction on germplasm if it is on a variety by variety

basis as opposed to a restriction on germplasm if it is on a physical trait basis.[134]

The position of the unaffiliated seed companies on the issue of compulsory licensing is opposite to that of the biotechnology companies. This difference may reside in the knowledge and perception of patents by the two groups. The seed companies who favor compulsory licensing for plant utility patents have been operating profitably under the current seed business environment. These established companies are concerned with any changes or possible negative effects on their business which may result from plant utility patents. These companies have not been subjected to the patent system and are unsure of the full ramifications of patenting plants. Their major concern is not having access to a major development which is patented. Access could be denied by the patentee unless there is compulsory licensing. The major developments which may be of interest include such areas as yield, herbicide resistance, disease resistance, seed content, e.g. oil, starch or protein, maturity or the like. Many of these developments will probably result from the application of cell culture or genetic engineering, rather than from classical breeding. Thus, the unaffiliated seed companies view utility patents as an interference in the development of new varieties.

The biotechnology companies have grown up with the patent system and recognize its value to them. These companies are involved in research to produce new traits in plants with the expectation of future financial return. Patents are essential to insure adequate financial return on the research investment. Compulsory licensing of patents could significantly affect the financial return of the biotechnology companies. Consequently, these companies do not support compulsory licensing.

Many issues now alleged as concerns with utility patents for plants were previously identified as concerns with the PVPA,[135] concerns which have not materialized.[136] No factors have been identified which would lead one to believe that the greater protection available from utility patents would lead to a realization of these fears. It is unlikely that the existence of a utility patent will restrict the availability of germplasm beyond the restrictions placed by plant variety protection and the seed industry. The patent system in the United States is considered to be a significant factor in the rapid industrialization of this country by stimulating a healthy infusion of inventions into the economy. Accusations that the patent system is a source of monopoly control and inflation have not been borne out in our history, because it is a rare patent that dominates the market in which it competes.

Plant patents and plant variety protection certificates were established to provide benefits for the public and the inventor or patentee. Two major benefits of the patent system are: (1) providing greater incentive for private industry to invest research efforts and funding in developing new inbreds, hybrids and varieties of plants; and (2) providing the consumer and industry with new and improved varieties of plants with better disease resistance, higher yield per acre, and new varieties of medicinal plants, plants that produce oils and fibers, and new and improved varieties of food crops and ornamental plants. Patents provide protection for the small inventor as well as the large. Strong patent protection will foster research and development of new plant types.

Plant varieties are, by their nature, ill-suited to protection by trade secret because they are not easily confined in an enclosed space and are therefore susceptible of piracy by others. Plant variety protection certificates provide protection for varieties and inbreds, but have both farmer's and research exemptions and do not protect seeds, plant parts, genes or physical traits, hybrids, methods of developing inbreds, hybrids, varieties or methods of plant regeneration. Plant patents protect asexually reproduced varieties only and do not protect plant parts of the asexually reproduced variety. Utility patents provide the greatest protection for plants and varieties. Utility

patents are capable of protecting all of the preceding materials and are free of the farmer's and research exemptions.

As previously discussed, an asexually reproduced plant can be protected by a plant patent or a utility patent. For some plants, such as chrysanthemums, protection can also be obtained by a plant variety protection certificate. It is not possible to protect an asexually reproduced plant by both a plant patent and a utility patent. Since both types of protection are patents, an attempt to obtain both types of patents would constitute double patenting. Thus, only one patent would be permissible. If both a plant patent and a utility patent were obtained for the same plant, both patents would be invalid.

A sexually reproduced plant could be protected by a plant variety protection certificate or a utility patent. There is an overlap in the statutory subject matter of the PVPA and the general patent act. This fact was recognized by the Board in Ex parte Hibberd.[137] The mere presence of an overlap in protection of statutory subject matter does not preclude the ability of obtaining more than one type of protection. In In re Yardley, 493 F.2d 1389 (CCPA 1974), the court held that proper subject matter, e.g. a clock face, could be protected by both a copyright and a design patent. However, the issue of double protection for sexually reproduced plants is not as clear. A PVP

certificate and a utility patent have some overlapping rights. Both prevent the sale, export and sexual multiplication (for marketing purposes) of the protected variety. A utility patent also prevents the use of the protected variety in developing a new variety and does not provide for a farmer's exemption, both of which are allowed by PVP certificate. A PVP certificate also prevents the import of a protected variety which is not prevented by a utility patent. The presence of similar rights under the PVPA and the patent laws could lead to a finding that double protection is not appropriate. However, the presence of the divergence in rights could lead to a contrary finding. It is an issue that appears too close to call. Since patents provide better protection, there would be no incentive to seek both types of protection for a new variety. At the present time, one company has obtained both plant variety protection certificates and utility patents for two corn inbreds.[138]

1. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, pp. 1-2 (Washington, D.C., U.S. Government Printing Office, 1930).

2. Townsend-Parnell Plant Patent Act of May 23, 1930 (Public-No. 245-71st Congress).

3. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, pp. 2-3 (Washington, D.C., U.S. Government Printing Office, 1930).

4. U.S. Congress, House Committee on Patents, Plant Patents, House Report No. 1129, pp. 13-14 (Washington, D.C., U.S. Government Printing Office 1930).

5. Thorne, H., "Relation of Patent Law to National Products", J. Patent Office Society 6:23 (1923); Cook, R., Florists Exchange and Horticultural Trade World, July 15, 1933 at p. 9.

6. U.S. Congress, House Committee on Patents, Plant Patents, hearings before the Committee, April 9, 1930, p. 7 (Washington, D.C., U.S. Government Printing Office, 1930).

7. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, pp. 6-8 (Washington, D.C., U.S. Government Printing Office, 1930).

8. Id., 4-5, which states:

> "In specifying the differences in characteristics the Patent Office will undoubtedly follow the practice among botanists in making use of verbal descriptions and photographic and other reproductions, taking some known plant as a basis of comparison. Modern methods of identification, together with such amplification thereof as may reasonably be expected, will render it possible and practicable to describe clearly and precisely the characteristics of a particular variety."

9. Amendment of Sec. 4888 of the Revised Statutes as Amended (35 U.S.C. § 33) to read "as complete as possible."

10. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, p. 5 (Washington, D.C., U.S. Government Printing Office, 1930).

11. Id. at p. 7.

12. Plant patent provisions can be found at 35 U.S.C. §§ 161-64.

13. U.S. Congress, House Committee on the Judiciary, Patent Law Codifications and Revisions, hearings before Subcommittee No. 3, June 13-15, 1951, p. 47 (Washington, D.C., U.S. Government Printing Office, 1951).

14. U.S. Congress, Senate Committee on the Judiciary, Patenting of Plants, Senate Report No. 1937, p. 1 (Washington, D.C., U.S. Government Printing Office, 1954).

15. Id. at p. 2.

16. See note 4.

17. See note 14.

18. U.S. Congress, House Committee on the Judiciary, Patenting of Plants, House Report No. 1455, pp. 1-2 (Washington, D.C., U.S. Government Printing Office, 1954).

19. Official Gazette for Patents, Vol. 1082, No. 4, Sept. 22, 1987.

20. Plant Variety Protection Act of December 24, 1970 (84 Stat. 1542) (7 U.S.C. 2321 et seq.).

21. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, House Report No. 91-1605, p. 1 (Washington, D.C., U.S. Government Printing Office, 1980).

22. U.S. Congress, Senate Committee on Agriculture and Forestry, Plant Variety Protection Act, hearings before the Subcommittee on Agricultural Research and General Legislation, June 11, 1970, p. 48 (Washington, D.C., U.S. Government Printing Office, 1970).

23. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, House Report No. 91-1605, pp. 1-2 (Washington, D.C., U.S. Government Printing Office, 1980).

24. Id. at pp. 1-4.

25. Plant variety protection was established in many European countries as a result of a convention initially acceded to by the European community. This

convention was UPOV (Union for the Protection of New Varieties of Plants).

26. The proposed amendment was found in bill S.1042. The Stark Bros.' Nurseries & Orchards Co. was opposed to the amendment because of the change. Stark Bros.' Co. surveyed many scientists at universities and experimental stations to obtain their views which were negative for the reasons: (A) biological instability inherent in sexually reproduced plants and (b) problems with enforcement of the resulting patents. See U.S. Congress, Senate Committee on the Judiciary, Patent Law Revisions, hearings before the Subcommittee on Patents, Trademarks and Copyrights, Jan. 30-Feb. 1, 1968, pp. 648-649, 670-673, 715-718 and 862-877 (Washington, D.C., U.S. Government Printing Office, 1968).

27. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, House Report No. 91-1605, p. 2; U.S. Congress, Senate Committee on Agriculture and Forestry, Plant Variety Protection Act, Senate Report No. 91-1138, p. 2 (Washington, D.C., U.S. Government Printing Office, 1980); Butler, L.J. & Marion, B.W., The Impacts of Patent Protection on the U.S. Seed Industry and Public Plant Breeding, North Central Regional Research Publication 304, N.C. Project 117, Monograph 16, Sept. 1985.

28. Okra, celery, pepper, tomato, carrot and cucumber.

29. U.S. Congress, Senate Committee on Agriculture, Nutrition and Forestry, Plant Variety Protection Act, hearings before the Subcommittee on Agricultural Research and General Legislation, June 17-18, 1980, pp. 18, 74, 143 (Washington, D.C., U.S. Government Printing Office, 1980).

30. Id. at pp. 73, 143.

31. These concerns were expressed by Environmental Policy Center, National Sharecroppers Fund, Consumer Federation of America, Environmental Defense Fund, and Public Citizens Congress Watch; U.S. Congress, Senate Committee on Agriculture, Nutrition and Forestry, Plant Variety Protection Act, hearings before the Subcommittee on Agricultural Research and General Legislation, June 17-18, 1980, pp. 24-35, 48-51, 57-59, 64-66, 117-123, 133-142, 153-157, 162-164 and 169-176 (Washington, D.C., U.S. Government Printing Office, 1980).

32. Butler, L.J. & Marion, B.W., The Impacts of Patent Protection on the U.S. Seed Industry and Public Plant Breeding, North Central Regional Research Publication 304, N.C. Project 117, Monograph 16, Sept. 1985.

33. Act of February 21, 1793, Ch. 11, § 1, Stat. 318.

34. V Writings of Thomas Jefferson at 75-76.

35. U.S. Congress, Senate Committee on the Judiciary, Revision of Title 35, United States Code, Senate Report No. 1979, p. 5 (Washington, D.C., U.S. Government Printing Office, 1952); U.S. Congress, House Committee on the Judiciary, Revision of Title 35, United States Code, "Patents", House Report No. 1923, p. 6 (Washington, D.C., U.S. Government Printing Office, 1952. The same language was used by P.J. Federico, a principal draftsman of the 1952 Act, in his testimony concerning § 101. U.S. Congress, House Committee on the Judiciary, Patent Law Codifications and Revisions, hearings before Subcommittee No. 3, June 13-15, p. 37 (Washington, D.C., U.S. Government Printing Office, 1951).

36. See Parker v. Flook, 437 U.S. 584 (1978); Gottschalk v. Benson, 409 U.S. 63 (1973); Funk Seed Co. v. Kalb Co., 333 U.S. 127 (1948); O'Reilly v. Morse, 15 How. 61 (1853); LeRoy v. Tatum, 14 How. 155 (1852).

37. 447 U.S. at 308-9.

38. 447 U.S. at 312.

39. 447 U.S. at 312 citing Senate Report No. 315, pp. 6-8 (see note 1); House Report No. 1129, pp. 7-9 (see note 4).

40. 447 U.S. at 312.

41. 447 U.S. at 313.

42. 447 U.S. at 320.

43. 447 U.S. at 320-1 citing House Report No. 91-1605, pp. 1-3 (see note 21); Senate Report No. 315, pp. 1-3 (see note 1).

44. 227 U.S.P.Q. at 444.

45. 227 U.S.P.Q. at 445.

46. United States v. Borden, 308 U.S. 189 (1939).

47. See 227 U.S.P.Q. at 446 for the examiner's detailed listing of the differences.

48. Citing In re Yardley, 493 F.2d 1839 (CCPA 1974).

49. Union pour la Protection des Obtentions Vegetales

50. Citing United States v. Capps, Inc., 204 F.2d 655 (4th Cir. 1953), aff'd. on other grounds, 348 U.S. 296 (1955).

51. The sources for the information which appears in this section are identified in Appendix A.

52. UPOV, Article 1 (1978).

53. Belgium, Denmark, France, the Federal Republic of Germany, Hungary, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, South Africa, Spain, Sweden, Switzerland, United Kingdom, and the United States.

54. UPOV Articles 4 and 5 (1978).

55. UPOV Articles 2 and 37 (1978).

56. For example, 15 years in Italy unless woody stem, then 30 years; 20-25 years in France depending on variety; 25 years in Germany for most varieties but 30 years for some.

57. Most countries issue plant variety certificates whereas Italy issues patents for new plant varieties.

58. See note 51.

59. Information provided by Dr. Francisco Calarco, Obligado & Cia, Buenos Aires, Argentina.

60. The Federal Court of Appeals affirmed the Canadian Patent Office's rejection of the patent application on the basis that a plant could not be considered a manufacture or composition of matter. Pioneer Hi-Bred Limited v. Commissioner of Patents, (1987) 14 C.P.R. (3d), 491. The Canadian Supreme Court has given leave to allow an appeal in this case.

61. Members are Austria, Belgium, France, the Federal Republic of Germany, Greece, Italy, Liechtenstein, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom.

62. According to Article 53(b), plant or animal varieties or essentially biological processes for the production of plants or animals are not patentable.

63. T 49183, OJ EPO 1984, p. 112.

64. Swiss Guidelines X-232.2 (March 1986) which states that the exclusion from patentability is not applicable. '"...where animals, plants and parts thereof are claimed which are not characterized in the claims by characteristics specific to that variety, and the claims, apart from possibly specifying the subject-matter of the invention (e.g. wheat or potatoes), contain only such characteristics which altogether are appropriate to several animal or plant varieties. ..."'

65. Information provided by Dr. Marco Faggioni, Fumero, Milan, Italy.

66. Information provided by Dr. Y. Savatier, Cabinet Lepeudry, Paris, France, and Dr. Ursula Kinkeldey, Grunecker, Kinkeldey, Stockmair & Partner, Munich, Federal Republic of Germany.

67. Section 1 of the German Patent Act. This requirement is similar to our non-obviousness requirement.

68. See In re Argoudelis, 434 F.2d 1390 (CCPA 1970), which held that a description of a microorganism could not satisfy 35 U.S.C. § 112 but that a deposit of the microorganism would satisfy the description requirement. In re Lundak, 773 F.2d 1216 (CAFC 1985) held that the deposit must be made in a public depository before the patent issues but must be available to the Patent Office as of the filing date.

69. Dr. Franz Lederer, Van Der Werth, Lederer & Reideren, Munich, Federal Republic of Germany.

70. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, p. 1 (Washington, D.C., U.S. Government Printing Office, 1930).

71. U.S. Congress, House Committee on Patents, Plant Patents, House Report No. 1129, p. 14 (Washington, D.C., U.S. Government Printing Office, 1930).

72. Id. at p. 11.

73. Id.

74. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, p. 2 (Washington, D.C., U.S. Government Printing Office, 1930)

75. Id.

76. See note 24.

77. 35 U.S.C. § 161.

78. U.S. Congress, Senate Committee on the Judiciary, Patenting of Plants, Senate Report No. 1937, pp. 2-4 (Washington, D.C., U.S. Government Printing Office, 1954).

79. See note 4.

80. Robb, H., J. Patent Office Society 15:752 at 757-8 (1933).

81. 2nd paragraph of 35 U.S.C. § 161 states that "The provision of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided."

82. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, p. 4 (Washington, D.C., U.S. Government Printing Office, 1930).

83. 35 U.S.C. § 102 sets forth the conditions of novelty as follows:

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or
>
> (c) he has abandoned the invention, or
>
> (d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for

patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

84. 35 U.S.C. § 162.

85. Robb, H., J. Patent Office Society 15:752 at 753 (1933).

86. Nicholson v. Bailey, 182 F.Supp. 509 (S.D. Fla., Orlando Div. 1960).

87. 537 F.2d 1347 (5th Cir. 1976).

88. Id. at 1380.

89. Id. at 1377, 1379.

90. Id. at 1783.

91. 433 F.Supp. 693 (N.D. Cal. 1977).

92. U.S. Congress, Senate Committee on Patents, Plant Patents, Senate Report No. 315, p. 4 (Washington, D.C., U.S. Government Printing Office, 1930), which states:

"The characteristics that may

distinguish a new variety would include, among others, those of habit; immunity from disease; resistance to cold, drought, heat, wind, or soil conditions; color of flower, leaf, fruit, or stem; flower; productivity, including ever-bearing qualities in case of fruits; storage qualities; perfume; form; and ease of asexual reproduction. Within any one of the above or other classes of characteristics the differences which would suffice to make the variety a distinct variety, will necessarily be differences of degree."

93. 276 F.2d 259 (9th Cir. 1960).

94. Id.; Cole Nursery Co. v. Youdath Perennial Gardens Inc., 17 F.Supp. 159 (N.D. Ohio 1936). See also Langrock, P., J. Patent Office Society 41:787 (1959).

95. 170 F.Supp. 519 (E.D. Tex. 1958).

96. See note 21.

97. U.S. Congress, Senate Committee on Judiciary, Plant Variety Protection Act, Senate Report No. 91-1246, p. 3 (Washington, D.C., U.S. Government Printing Office, 1970).

98. 116 Cong. Rec. 40295 (1970).

99. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, House Report No. 91-1605, pp. 1-2 (Washington, D.C., U.S. Government Printing Office, 1980).

100. See note 26 and accompanying text.

101. UPOV (International Convention for the Protection of New Varieties of Plants).

102. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, House Report No. 91-1605, pp. 1-4 (Washington, D.C., U.S. Government Printing Office, 1980).

103. See note 32, note 105 and note 105 at p 142.

104. U.S. Congress, House Committee on Agriculture, Plant Variety Protection Act, hearings before the Subcommittee on Department Investigations, Oversight and Research, July 19, 1979 and April 22, 1980, p. 6 (Washington, D.C., U.S. Government Printing Office, 1970).

105. U.S. Congress, Senate Committee on Agriculture, Nutrition and Forestry, Plant Variety Protection Act, hearings before the Subcommittee on Agricultural Research and General Legislation, June 17-18, 1980, p. 127 (Washington, D.C., U.S. Government Printing Office, 1970).

106. 7 U.S.C. § 2402.

107. 7 U.S.C. § 2541, which reads:

> "Except as otherwise provided in this subchapter, it shall be an infringement of the rights of the owner of a novel variety to perform without authority, any of the following acts in the United States, or in commerce which can be regulated by Congress or affecting such commerce, prior to expiration of the right to plant variety protection but after either the issue of the certificate or the distribution of a novel plant variety with the notice under section 2567 of this title:
>
> > (1) sell the novel variety, or offer it or expose it for sale, deliver it, ship it, consign it, exchange it, or solicit an offer to buy it, or any other transfer of title or possession of it;
> >
> > (2) import the novel variety into, or export it from, the United States;
> >
> > (3) sexually multiply the novel variety as a step in marketing (for growing purposes) the variety; or
> >
> > (4) use the novel variety in producing (as distinguished from developing) a hybrid or different variety therefrom; or
> >
> > (5) use [sic] seed which had been marked 'Unauthorized Propagation

Prohibited' or 'Unauthorized Seed Multiplication Prohibited' or [sic-its] progeny thereof to propagate the novel variety; or

(6) dispense the novel variety to another, in a form which can be propagated, without notice as to being a protected variety under which it was received; or

(7) perform any of the foregoing acts even in instances in which the novel variety is multiplied other than sexually, except in pursuance of a valid United States plant patent; or

(8) instigate or actively induce performance of any of the foregoing acts."

108. 7 U.S.C. § 2404.

109. 7 U.S.C. § 2543.

110. 7 U.S.C. § 2541.

111. 7 U.S.C. § 2426; Publication in the Plant Variety Protection Variety Protection Office Journal.

112. 7 U.S.C. §§ 2401-2.

113. 7 U.S.C. § 2402, which reads:

"(a) The breeder of any novel variety of sexually reproduced plant (other than fungi, bacteria, or first generation hybrids) who has so reproduced the variety, or his successor in interest, shall be entitled to plant variety protection therefor, subject to the conditions and requirements of this title unless one of the following bars exists:

(1) Before the date of determination thereof by the breeder, or more than one year before the effective filing date of the application therefor, the variety was (A) a public variety in this country, or (B) effectively available to workers in this country and adequately described by a publication reasonably

deemed a part of the public technical knowledge in this country which description must include a disclosure of the principal characteristics by which the variety is distinguished.

(2) An application for protection of the variety based on the same breeder's acts, was filed in a foreign country by the owner or his privies more than one year before the effective filing date of the application filed in the United States.

(3) Another is entitled to an earlier date of determination for the same variety and such other (A) has a certificate of plant variety protection hereunder or (B) has been engaged in a continuing program of development and testing to commercialization, or (C) has within six months after such earlier date of determination adequately described the variety by a publication reasonably deemed a part of the public technical knowledge in this country which description must include a disclosure of the principal characteristics by which the variety is distinguished.

(b) The Secretary may, by regulation, extend for a reasonable period of time the one year time period provided in subsection (a) of this section for filing applications, and may in that event provide for at least commensurate reduction of the term of protection."

114. 7 U.S.C. § 2401.

115. Id.

116. Id.

117. 694 F.2d 1012 (5th Cir. 1983).

118. Asgrow Seed Co. v. Kunkle Seed Company, Inc. et al., Appeal No. 87-1402 (CAFC), appeal from W.D. La, Alexandria Division. Brief of Asgrow Seed Co. attached hereto as Appendix B.

119. United States Constitution, Art. I, § 8.

120. U.S. Congress, Senate Committee on the Judiciary, Revision of Title 35, United States Code, Senate Report No. 1979, p. 5 (Washington, D.C., U.S. Government Printing Office, 1952); U.S. Congress, House Committee on the Judiciary, Revision of Title 35, United States Code, "Patents", House Report No. 1923, p. 6 (Washington, D.C., U.S. Government Printing Office, 1952).

121. Diamond, Commr. Pats. v. Chakrabarty, 447 U.S. 303 (1980).

122. Ex parte Hibberd, 227 U.S.P.Q. 443 (BPAI 1985).

123. 35 U.S.C. § 101.

124. 35 U.S.C. § 154.

125. See note 83.

126. 35 U.S.C. § 103, which reads:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

127. 35 U.S.C. § 112.

128. See In re Argoudelis, 434 F.2d 1390 (CCPA 1970), which held that a description of a microorganism could not satisfy 35 U.S.C. § 112 but that a deposit of the microorganism would satisfy the description requirement. In re Lundak, 773 F.2d 1216 (CAFC 1985) held that the deposit must be made in a public depository before the patent issues but be available

to the Patent Office as of the filing date.

129. This policy does not appear to comply with Congress' intent and the PVPA that the protected plant varieties can be used for developing new varieties. According to the statement of B. Schlei, Administrator, Agricultural Marketing Service, USDA, "a limited number of these seeds [from a variety protection application] ... are available to the public at any time for use in developing new varieties and for purposes of conducting research on protected varieties." U.S. Congress, Senate Committee on Agriculture, Nutrition and Forestry, Plant Variety Protection Act, hearings before the Subcommittee on Agricultural Research and General Legislation, June 17-18, 1980, p. 71 (Washington, D.C., U.S. Government Printing Office, 1970).

130. 416 U.S. 470, 484 (1973).

131. 440 U.S. 257 (1979).

132. See note 31 and accompanying text.

133. See note 32 and accompanying text.

134. A recent example would be a patent, 4,627,192, which issued to Sigco Research Inc. This patent covers any sunflower seed which has an oleic acid content of approximately 80% and a ratio of linoleic acid to oleicacid of less than 0.09. The view of most seed companies is that developing a sunflower seed having these traits was an obvious goal and that no one company should be able to have the right to exclude others from developing such a sunflower seed.

135. See note 31 and accompanying text.

136. See note 32 and accompanying text.

137. 227 U.S.P.Q. at 446 (BPAI 1985).

138. DeKalb-Pfizer has obtained protection for the two corn inbreds HBA1 (U.S. Patent No. 4,594,810 and PVP Certificate 8500069) and 78010 (U.S. Patent No. 4,654,466 and PVP Certificate 8500126). The applications for both types of protection were filed before the decision in Exparte Hibberd when it was not known whether utility patents would be granted on plants.

APPENDIX A

The following sources provided information which was utilized in preparing the section of the report entitled "INTERNATIONAL INTELLECTUAL PROPERTY PROTECTION FOR PLANTS."

Plant Variety Protection Laws and Treaties, International Union for the Protection of New Varieties of Plants, Geneva (1985).

Manual Industrial Property, OctooibureauLox en Stigter, B.V., Amsterdam (1986).

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BRIEF OF APPELLANT
ASGROW SEED CO.

IN THE

United States Court of Appeals

FOR THE FEDERAL CIRCUIT

Appeal No. 87-1402

ASGROW SEED CO.

Plaintiff-Appellant,

v.

KUNKLE SEED CO., INC., DAVE KUNKLE,
KEN KUNKLE & KUNKLE FARMS

Defendants-Appellees

APPEAL FROM THE
U.S. DISTRICT COURT FOR THE WESTERN DISTRICT OF LOUISIANA
ALEXANDRIA DIVISION
JUDGE F. A. LITTLE, JR.

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CERTIFICATE OF INTEREST

The undersigned counsel of record for Plaintiff-Appellant, Asgrow Seed Co., furnishes the following list in compliance with Rule 8.

(a) Asgrow Seed Co.

(b) Not applicable.

(c) Plaintiff-Appellant is a wholly owned subsidiary of The Upjohn Company.

(d) Percy, Smith, Foote & Honeycutt represented the Plaintiff-Appellant in the lower tribunal, and a member of that firm is of counsel to the Plaintiff-Appellant in this court.

Wegner & Bretschneider is representing the Plaintiff-Appellant in this court.

Respectfully submitted,

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DATE: August 17, 1987

IDENTIFICATION OF RELATED CASE

The outcome of this appeal may affect the outcome of the following case:

Asgrow v. Beggs, CA F 86-199C,

Eastern District of Missouri, Southeastern Division

A preliminary injunction has issued in this case and discovery is proceeding.

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IN THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

APPEAL NO. 87-1402

ASGROW SEED COMPANY,
Appellant,

v.

KUNKLE SEED COMPANY, INC., DAVE KUNKLE,
KEN KUNKLE, & KUNKLE FARMS
Appellees.

APPEAL FROM THE DECISION OF THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF LOUISIANA DENYING PRELIMINARY INJUNCTION

I. ISSUE TO BE DECIDED

In denying a motion for preliminary injunction, did the District Court err in finding no likelihood of success on the merits by interpreting the Plant Variety Protection Act (the PVP Act) to protect a farming operation segregating over 84,000 bushels (over five million pounds) of soybean for sale as seed in the past three years as one "whose primary farming occupation is the growing of crops for sale for other than reproductive purposes" and thus within the right to save seed exemption granted by 7 U.S.C. §2543?

II. STATEMENT OF THE CASE

A. Jurisdiction

Asgrow Seed Co. filed a complaint in the U.S. District Court for the Western District of Louisiana alleging that the actions

of Defendants-Appellees infringed Asgrow's exclusive rights under the Plant Variety Protection Act. The District Court denied Asgrow's Motion for Preliminary Injunction in a Ruling dated April 1, 1987, and adhered to that Ruling upon reconsideration on May 26, 1987. This appeal followed.

This court's jurisdiction is based upon 28 U.S.C. §1292(a)(1), which grants the right of interlocutory appeal directly from the denial of an application for an injunction, and 28 U.S.C. §§1292(c)(1) and 1295(a)(1), which grant this court appellate jurisdiction over interlocutory appeals from district courts in plant variety protection actions.

B. Background Information

1. The Parties

Plaintiff/Appellant Asgrow Seed Company (Asgrow) was started in 1856, and is a world-wide research-based breeder, producer and marketer of vegetable and field seed, including soybeans. Asgrow has been awarded, inter alia, Plant Variety Protection Certificates 8000147 and 840097 for soybean varieties A5474 and A5980, respectively. App. 50-52, 382-395.

Defendant-Appellee Kunkle Farms is a Louisiana partnership, wholly and equally owned by Defendants Dave Kunkle and Ken Kunkle. App. 79. Kunkle Farms operates on about 3,300 acres in Concordia Parish, near Vidalia, Louisiana. App. 79, 81, 145. Defendant Ken Kunkle is in charge of the day-to-day operations of Kunkle Farms. App. 267, 276. Kunkle Farms has grown Asgrow

protected soybean varieties A5474 and A5980 and sold these varieties as seed to farmers. App. 104-110. Defendant Kunkle Seed Company, Inc. (Kunkle Seed) is a Louisiana Corporation, whose shares are owned wholly and equally by Defendants Dave Kunkle and Ken Kunkle. App. 267. Defendant Dave Kunkle is responsible for managing the operations of Kunkle Seed. App. 267. Kunkle Seed is an Asgrow distributor. App. 332-333.

2. The Seed Industry

The process of developing and bringing to market new varieties of seed is long and expensive, similar in many ways to the development of new pharmaceutical products. First, the genetic make-up of potential parent varieties must be evaluated, and then a cross is made. A large number of lines from those crosses is subjected to increasingly selective trials. Of course, since growing plants are involved, the amount of time involved for each trial is on the order of months (about one year), and the screening process thus will take four years or more. Almost eight years are required between the initial cross and final product, with an additional two years or so being required to obtain plant variety protection. App. 46-50.

To give an idea of the scope of the effort involved, in 1983 Asgrow employed five Ph.D plant breeders and operated seven breeding locations and 38 evaluation locations. In 1983, Asgrow conducted 1,200 crosses combining genetically different material.

In 1983, 120,000 individual lines were evaluated, while only four were introduced onto the market. App. 49-50.

Asgrow initiated its soybean breeding program in 1973, after the enactment of the PVP Act. Prior to that time, Asgrow was not interested in developing soybean varieties because the lack of protection made it impossible to recoup the investment required. Asgrow has not undertaken research in countries not providing plant variety protection. App. 46-47.

Once a desirable variety has passed the screening process and is ready for market, four seed stages take place before marketing. The first stage of the seed is "breeder seed", which is controlled by the sponsor breeding institution and is the source for the production of seed of the other categories. The second category of seed is "basic seed", which is the progeny of the breeder seed, and is grown by the institution to produce "foundation seed". The foundation seed, which is grown in relatively large quantities, is then used to produce "commercial seed" which is then marketed to be planted and grown as crop. The planting and harvesting of the foundation seed generally is done under contract with growers outside of the breeding institution, but under the strict supervision of the breeding institution. Thus, four growing seasons are necessary to produce commercial seed after the desired new variety has been developed, and the total time from cross to market is generally at least 10 years. Careful, long-range planning is necessary for the breeder to ensure proper supplies of seed. App. 56-61, 201-202.

Developed seed generally can be categorized as "proprietary", i.e., produced by private breeding companies such as Asgrow, or "public", produced for example under government sponsorship at state universities. Proprietary seed is generally marketed through distributors and dealers. Distributors would be large farm supply companies or cooperatives. Dealers can be farmer/dealers, who combine farming operations with marketing of seed or merchant/dealers, who run small farm supply stores or storage elevators. The distributors and dealers are generally authorized by contract with the seed producer to sell the seed produced and bagged by the producer.

3. The Operation of the Defendants-Appellees

Kunkle Farms grows a number of crops. The primary crop is soybeans. The others include wheat, rice, corn and milo. App. 80-82. Protected soybean varieties A5474 and A5980 are included in the soybean varieties grown by Kunkle Farms. App. 104-105. Kunkle Farms has been in business since 1976. While the farm grows significant quantities of public soybean varieties, the production of proprietary varieties was started in recent years, and the acreage devoted to proprietary varieties has been increased, as private breeders have been producing varieties superior to the public varieties. App. 79-82, 86, 89-90, 139. Defendant Ken Kunkle operates the farm and makes the decisions about what crop to plant and how much of the crop to plant. App. 276.

Kunkle Farms does not replant the seed it grows, but instead plants fresh seed from Kunkle Seed each year. App. 165. Kunkle Farms plants more expensive registered class seed for public varieties of soybeans, which is necessary if certified seed sellable to farmers is to be produced. Kunkle Farms has its plantings of public varieties certified through the Louisiana Department of Agriculture for sale as seed. App. 85-87, 288-290, 323. It is the intent of Kunkle Farms to sell as much as possible of its crop to farmers as seed, as opposed to sale of the seed to an elevator as a commodity. App. 87.

Kunkle Seed is located across the road from Kunkle Farms. Kunkle Seed is in the business of providing custom seed-cleaning and processing services for farmers, as well as seed warehousing facilities, services which are not provided by Kunkle Farms. Although most of the bookkeeping for Kunkle Farms is done in the offices of Kunkle Seed, and the two operations share a common bookkeeper/secretary, separate records are maintained for each. App. 94, 267-276.

The testimony of the Defendants-Appellees indicated that farmers wishing to purchase seed of a protected variety from Kunkle Farms would speak to Defendant Ken Kunkle, negotiate quantity and price, and then purchase the agreed-upon quantity in bulk. Kunkle Farms would hold the order until enough orders are accumulated to make a full cleaning load, and then carry the load

to Kunkle Seed for cleaning and bagging[1]. The cleaned seed would then be packaged in plain brown bags[2] bearing the various purchasers' names and sometimes an identification of the seed variety in the bag. The farmers generally purchase seed from Kunkle Farms on the basis of the quantity of cleaned bushels, and the refuse is returned to Kunkle Farms for sale to an elevator. App. 94-99, 124-126, 279-282. Defendant-Appellee Dave Kunkle testified that he did not refer farmers at Kunkle Seed to Kunkle Farms to purchase seed, although purchasers of private seed varieties all go directly to Ken Kunkle at Kunkle Farms while purchasers of public seed varieties all deal with Kunkle Seed. All of Kunkle Farms' public variety soybeans sold as seed were sold to Kunkle Seed and resold to farmers by Kunkle Seed. App. 279, 290, 293-294. The price paid to Kunkle Farms by Kunkle Seed for the public variety of soybeans is fixed after the selling season is over. App. 291.

III. THE PLANT VARIETY PROTECTION ACT, 7 U.S.C. §2321 ET SEQ

A. Background of the Act

It is believed that this Appeal is the first Appeal to this court directly concerned with the PVP Act. The PVP Act was enacted to ensure developers of novel varieties of sexually-

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[1] Thus, a number of orders are included in the full cleaning load and are separated after cleaning and bagging by Kunkle Seed.

[2] Hence, the term "brown bag seed" in referring to seed of proprietary varieties produced and sold by persons other than the proprietor.

reproduced plants of the exclusive right to sell, reproduce, import, export or use the varieties in the production of hybrids or different varieties for a limited period of time. The protection provided is similar to that provided for asexually-reproduced varieties through plant patents issued by the Patent and Trademark Office. The exclusive rights granted by the Act are intended to encourage the development of improved varieties of sexually-reproduced plants and to make them available to the public, providing protection available for those who breed, develop or discover the varieties, thus promoting the public interest through progress in agriculture. Congress, in 1970, specifically recognized that although special protection under the Patent Law was granted to varieties of plants which reproduce asexually, no such special protection[3] was available for plants which reproduce sexually, and specifically mentioned cotton and soybeans as two important crops for which the protection was not available (H.R. Rep. 91-1605, reported in 1970 U.S. Code Cong. & Ad. News, 5082, 5082-5084).[4]

The protection afforded by the PVP Act was expected to provide the following benefits:

1. Stimulate private plant breeding;

2. Allow Government agricultural experiment stations to increase efforts on needed basic research;

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[3] Utility patent protection is also available to plants. Ex parte Hibberd, 227 USPQ 443 (PTO Bd. App. Int. 1985).

[4] The Legislative History is attached to this brief for convenience as Addendum A.

3. Permit public expenditures for applied plant breeding to be deviated to important areas which industry may not pursue;

4. Give farmers and gardeners more choice and varieties which are better in yield, quality, etc.;

5. Make American agricultural products more competitive in world markets; and

6. Benefit consumers and other purchasers of crops by improved quality and/or aiding the production needed to serve them.

Such benefits had been seen in the area of asexual reproduction after the enactment of the Plant Patent Act, as well as in the effect on the English plant breeding industry of the enactment of the English Plant Varieties and Seeds Act 1964. To provide more incentives for U.S. private breeders to develop new varieties of sexually-reproducing plants, Congress provided the breeder with a limited period of exclusion during which the breeder would be free from having to compete against its own variety (H.R. Rep. 91-1605, pg. 5083).

B. Similarities to the Patent Act

The PVP Act shares many characteristics of the patent statute. Subsections (1)-(3) of Section 42 (7 U.S.C. §2402) entitle a breeder of a novel variety of sexually-reproduced plants to plant variety protection, subject to certain bars similar to 35 U.S.C. §§102(a),(b),(d) and (g). Section 55 (7

U.S.C. §2425) provides for reliance on foreign priority and continuing applications. According to Section 56 (7 U.S.C. §2426), applications are to be kept confidential. Section 83 (7 U.S.C. §2483) provides the breeder with the right to exclude others from selling the variety, offering it for sale, reproducing it, importing it, etc., for 18 years. Section 101 (7 U.S.C. §2531) provides plant variety protection with the attributes of personal property, assignable by an instrument in writing. Under Section 121 (7 U.S.C. §2561), the remedy for infringement is by civil action. Section 122 (7 U.S.C. §2562) establishes a presumption of validity for the certificate of plant variety protection. Other similarities are apparent upon further comparison of the statutes.

C. Infringement and the "Right to Save Seed" Exemption From Infringement

Section 111 of the PVP Act defines the following acts as infringements:

1. Selling the novel variety, or offering it or exposing it for sale, delivering it, shipping it, consigning it, exchanging it, or soliciting an offer to buy it, or any other transfer of title or possession of it;

2. Importing the novel variety into, or exporting from, the United States;

3. Sexually multiplying the novel variety as a step in marketing (for growing purposes) the variety; or

4. Using the novel variety in producing (as distinguished from developing) a hybrid or different variety therefrom; or

5. Using seed which had been marked "Unauthorized Propagation Prohibited" or "Unauthorized Seed Multiplication Prohibited" or progeny thereof to propagate the novel variety; or

6. Dispensing the novel variety to another, in a form which can be propagated, without notice as to being a protected variety under which it was received; or

7. Performing any of the foregoing acts even in instances in which the novel variety is multiplied other than sexually, except in pursuance of a valid United States plant patent; or

8. Instigating or actively inducing performance of any of the foregoing acts. (7 U.S.C. §2541.)

Section 113 provides a "right to save seed" exemption to the infringement provisions, stating:[5]

> [A] Except to the extent that such action may constitute an infringement under subsections (3) and (4) of section 111, it shall not infringe any right hereunder for a person to save seed produced by him from seed obtained, or descended from seed obtained, by authority of the owner of the variety for seeding purposes and use such saved seed in the production of a crop for use on his farm, or for sale as provided in this section:
>
> [B] Provided, That without regard to the provisions of section 111(3) it shall not infringe any right hereunder for a person,

[5]Division of Section 113 into subparagraphs made herein for clarity.

> whose primary farming occupation is the growing of crops for sale for other than reproductive purposes, to sell such saved seed to other persons so engaged, for reproductive purposes, provided such sale is in compliance with such State laws governing the sale of seed as may be applicable.
>
> [C] A bona fide sale for other than reproductive purposes, made in channels usual for such other purposes, of seed produced on a farm either from seed obtained by authority of the owner for seeding purposes or from seed produced by descent on such farm seed obtained by authority of the owner for seeding purposes shall not constitute an infringement. A purchaser who diverts seed from such channels to seeding purposes shall be deemed to have notice under section 127 that his actions constitute an infringement. (7 U.S.C. §2543) [Emphasis added]

The issues of this appeal turn on the applicability of the right to save seed exemption to Kunkle Farms.

IV. SUMMARY OF THE ARGUMENT

Congress enacted the PVP Act with the intent of encouraging private industry to develop improved varieties of sexually-reproducing plants. The broad interpretation of the right to save seed exemption adopted by the District Court in finding that Asgrow had not demonstrated a likelihood of success on the merits frustrates the intent of Congress. Defendants-Appellees are selling Asgrow's protected varieties[6] on a large scale, depriving Asgrow of the exclusive rights under the PVP Act to which it is entitled.

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[6] As well as the protected varieties of other breeders such as Delta and Pine Land Co.

V. ARGUMENT

A. The Standards for Preliminary Injunction

The District Court considered Asgrow's likelihood of success on the merits, irreparable harm to Asgrow, harm to the Defendants, and the public interest in evaluating Asgrow's motion for preliminary injunction. These are the well-established criteria for granting or denying preliminary injunctions and Asgrow does not criticize the use of these guidelines. H. H. Robertson Co. v. United Steel Deck, Inc. ___ F.2d ___, 2 USPQ 2d 1926 (Fed. Cir. 1987). However, the District Court erred in its interpretation of the Plant Variety Protection Act, and thus conducted a faulty evaluation leading to an abuse of discretion.

B. The District Court Interpreted the Plant Variety Protection Act Erroneously in Deciding against Asgrow on the Issue of Likelihood of Success

Defendants have admitted that they have grown and sold for seed (i.e., "reproductive purposes") Asgrow's protected soybean varieties A5980 and A5474. App. 27-28, 104-106, 396-399. This violates Section 111 of the Act (7 U.S.C. §2541(1) and (3)). Defendants-Appellees have presented no evidence or even arguments against the validity of Asgrow's Plant Variety Certificates. The presumption of validity under Section 122 (7 U.S.C. §2562), therefore, stands.[7] Consequently, Asgrow has established a

[7] Cf. Ralston Purina Co. v. Far-Mar-Co., Inc., 772 F.2d 1570, 227 USPQ 177 (Fed. Cir. 1985). Due to the paucity of case law concerning the PVP Act, and the strong similarities between the PVP Act and the patent statute (See Section IIIB, supra), case law interpreting the patent statute is equally applicable here.

strong likelihood of success on the merits unless the Defendants are entitled to the right to save seed exemption of Section 113 (7 U.S.C. §2543).

1. The Standard Adopted by the District Court Emasculates the Protection Provided by the Plant Variety Protection Act

The District Court's initial decision and decision on reconsideration point to two single words in Section 113 (7 U.S.C. §2543) in finding Kunkle Farms to be within the right to save seed exemption. The initial decision focused on the use of the word "primary", concluding that the sole factor to be considered is whether less than half by volume of the crop produced was sold for seed. App. 6. In the decision on reconsideration, the court further emphasized the presence of the word "sale" to support its initial decision. App. 10-11. This is a stilted construction of the statute, unrelated to the intent of Congress and the actual operation of the Defendants-Appellees.

It is improper to interpret §113 by taking two single words out of context. The entire clause under consideration reads:

> Except to the extent that such action may constitute an infringement under subsections (3) and (4) of section 111, it shall not infringe any right hereunder for a person to save seed produced by him from seed obtained, or descended from seed obtained, by authority of the owner of the variety for seeding purposes and use such saved seed in the production of a crop for use on his farm, or for sale as provided in this section: Provided, That without regard to the provisions of section 111(3) it shall not infringe any right hereunder for a person, whose primary farming occupation is the

> growing of crops for sale for other than reproductive purposes, to sell such saved seed to other persons so engaged, for reproductive purposes, provided such sale is in compliance with such State laws governing the sale of seed as may be applicable.

Thus, the question to be resolved is whether the "primary farming occupation" of the Defendants-Appellees is "the growing of crops for sale for other than reproductive purposes". The terms "occupation" and "growing", with their implications of intent, must be considered in determining the scope of the exemption.

The PVP Act was enacted to stimulate the production of new and improved varieties of sexually-reproducing plants. The statutory vehicle for encouraging the production of new varieties by private industries is, as in the patent statute, the granting to the breeder of an exclusive right for a limited period of time. To encourage the development of new varieties, the breeder is given exclusive rights in its new varieties, to provide the breeder some assurance of an opportunity to recover the tremendous cost of developing and screening new varieties without having to compete against its own discovery in the marketplace.

a. The District Court's Standard Ignores the Realities of the Marketplace

The District Court's mechanical analysis of the total volume produced by the organization with respect to the amount sold for seed emasculates the protection Congress intended in enacting plant variety protection. Under the analysis of the District Court, the size of the organization is of no moment. An

operation producing a million bushels of soybeans, for example, could sell 499,999 bushels of beans as seed.[8] Further, by including all crops in its calculus, the District Court would permit an operation growing large amounts of one crop as a commodity to sell up to that amount of another crop as seed.

b. The District Court's Standard Precludes Injunctive Relief

The District Court's misplaced reliance on the relative amount of the harvest actually sold as seed also deprives the breeder of prospective relief. The determination of how much of a harvest has been sold for seed can only be made after the harvest has been collected and sold. Thus, infringement could be established only after sales have been made. An injunction could not be obtained, for who could say how much of the next year's crop would be sold for seed? Poor weather conditions might result in only small amounts being available for seed, or demand might be low.

The "protection" to the breeder afforded under the standard adopted by the District Court provides scant incentive indeed to the development of new varieties. The long delays and costs associated with developing and bringing new varieties to market

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[8] This is not far-fetched, as can be seen by review of some of the acreages registered in Louisiana for growing public varieties of soybeans for seed in Plaintiff's Hearing Exhibit 4 (App. 436-442, 462-465, 517-523).

make it essential for private firms engaged in plant breeding to have meaningful protection for the varieties that they develop. Under the standard adopted by the District Court, the protection intended by Congress would be consumed by the right to save seed exemption.

2. The District Court's Analysis is Contrary to the Fifth Circuit's Interpretation of the Right to Save Seed Exemption

Asgrow is aware of only one decision addressing the meaning and breadth of the right to save seed exemption, Delta and Pine Land Co. v. Peoples' Gin Company, 694 F.2d 1012 (5th Cir. 1983). In Delta, the court was presented with a situation in which farmers who were members of a cooperative were saving seed of a protected variety and selling it through the cooperative. Delta and Pine Land Co., the originator of the protected variety, sought injunctive relief. In response, the farmers-members of the cooperative claimed that the sales were exempt under 7 U.S.C. §2543, the right to save seed exemption. In construing the meaning of the right to save seed exemption, the court stated:

> In Section 2581, Congress made clear its purpose for enacting the Act.
>
> 'It is the intent of Congress to provide the indicated protection for new varieties by exercise of any constitutional power needed for that end, so as to afford adequate encouragement for research, and for marketing when appropriate, to yield for the public, the benefits of new varieties.'
>
> During the course of its enactment, some legislators expressed concern that the new law would impose higher cost on the farmer,

and ultimately, on the consumer. Section 2543 was added in an attempt to allay these concerns. Although that section exempts sales between farmers, Congress recognized that higher seed prices might nevertheless result. In response to a question voicing concern for the farmers, Representative Poage, a Congressman instrumental in the passage of the Act, stated:

> I do not think that there is any doubt that it will mean if somebody produces a seed that gives better results than anybody else's seed, and if he is the only one who can sell that seed, then he will get more for it. This is the only way we know to get people to invest their time and money. It is expensive to develop such seeds. So in the long run, we believe there will be beneficial results for the producers and farmers.

116 Congressional Record, 40, 295-40, 303, 40, 295 (daily ed. December 8, 1970) (Statement of Rep. Poage). Thus, contrary to what Peoples' and Hollandale argue, the crop exemption was not intended to provide farmers with unlimited insulation from the negative side effects of the Act.

In purpose and operation, the Farmers Exemption appears to be at odds with the primary purpose of the Act. While the main body of the Act assures developers of novel varieties, the exclusive right to sell and reproduce that variety, the crop exemption dilutes that exclusivity, by allowing individual farmers to sell the protected variety without liability. The broader the construction given the exemption, the smaller the incentive for breeders to invest the substantial time and effort necessary to develop new strains. The less time and effort that is invested, the smaller the chance of discovering superior agricultural products. If less time and effort is invested, long-term benefits to the farmer in the form of superior crops and higher yields will be lost. Although it may appear that the broadest reading of the exemption would

> benefit farmers today, it could be detrimental to their interests tomorrow.
>
> Thus, the narrower reading of the exemption is more in keeping with Congress' primary objective. Such a reading creates the greatest amount of internal harmony in the overall statutory scheme. See Zemurray Foundation v. United States, 687 F2d, 97 at 102 (5th Cir., 1982); Duke v. University of Texas at El Paso, 663 F2d, 522, 525 (5th Cir., 1981). We therefore conclude that Congress did not intend for the crop exemption to cover every sale from one farmer to another. [Delta, at 1015-1016] [Emphasis added].

As recognized in the well-reasoned analysis of the Fifth Circuit, the right to save seed exemption must be construed as a narrow exception to the broad exclusive right of the Act if the intent of Congress is to be carried out. The reasoning followed by the Fifth Circuit in denying the right to save seed exemption to the cooperative in Delta is fully applicable to the Defendants-Appellees at bar.

Section 2543 does not use "primary" and "sale" in vacuo, but rather as part of a concept, i.e., "primary farming occupation is the growing of crops for sale for other than reproductive purposes". Looking only to the volume percentage of the harvest actually sold as seed is overly simplistic and ineffectual in providing breeders with the incentive Congress intended. Certainly factors such as the total amount sold for seed, the actual and relative revenues derived from the sales of seed, the geographic extent of sales, the nature of the individual sales and the intent of the farming organization must be evaluated in determining whether an organization's "primary farming occupation

is the growing of crops for sale for other than reproductive purposes".

3. Kunkle Farms Does Not Have the "Growing of Crops for Other Than Reproductive Purposes" as its Primary Farming Occupation

Kunkle Farms is not an organization whose primary farming occupation is the growing of crops for sale for other than reproductive purposes. It is the stated intent of Kunkle Farms to sell as much of its seed as possible for reproductive purposes and sell as little as possible as a commodity.

For the years 1984-6, Kunkle Farms segregated 32,401; 31,719; and 20,470 bushels of soybeans for possible sale as seed. App. 91-93. In 1986, Kunkle Farms sold over 1.42 million pounds of protected seed (23,723 bushels[9] at about 60 pounds per bushel- App. 106, 117-118, 325-326) and is increasing its production of protected varieties as the demand for protected varieties of seed increases. Kunkle Farms' income for 1986 amounted to about $533,000, of which about $501,000 came from soybeans. App. 323-324. Assuming a price of $8.50/bushel (App. 314), over $200,000 of the total came from the sale of protected soybean seed alone. This does not even take into account the income from public varieties sold as seed or the income from the refuse resulting from the cleaning of the seed, which is returned to Kunkle Farms.

In the first half of 1986, about eighty customers (App. 396-399) came to Kunkle Farms from long distances (App. 110-112, 158-

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[9] Each bushel will seed about one acre of field. App. 212.

159, 566-568) to purchase protected varieties of seed, including over forty customers for Asgrow Seed. For the year 1986, Kunkle Farms accounted for all of Kunkle Seed's acreage for producing certified public variety soybeans listed with the Louisiana Department of Agriculture. App. 289. In 1986, only 26,239.53 acres throughout Louisiana were listed for producing certified seed, of which Kunkle Farms accounted for 1210.5 acres, about 6.5%. App. 515-523.

Kunkle Farms does not replant the seed it produces, but rather uses fresh seed obtained from Kunkle Seed each year, in order to "get the best quality back to sell [to] the farmer the following year." App. 165.[10] Kunkle Farms sells as much of its crop for seed as demand and weather conditions (which might result in an inferior crop unsuitable for sale as seed) permit. App. 87-90. Strangely, Kunkle Farms apparently offers only protected varieties to farmers. Any public varieties of soybean sold as seed by Kunkle Farms go to the farmers through Kunkle Seed, which according to Defendants-Appellees does not "sell" brown bag protected varieties. App. 290.

Kunkle Farms is in the business of producing and selling soybeans for seed. Kunkle Farms' sale of soybeans as a commodity is incidental to its primary function and intent of selling soybeans for seed. Kunkle Farms' "primary farming occupation" thus is not the growing of crops for sale for other than

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[10] To this extent, Kunkle Farms does not "save" seed at all, clearly rendering it outside the limited purpose of the exemption.

reproductive purposes. Kunkle Farms' primary farming occupation is to grow as many seed-quality soybeans as possible and sell them as such. Kunkle Farms' acreage is either devoted to growing protected varieties (which are sold almost entirely as seed, weather permitting) or certified for the production of seed-quality public varieties. The mere fact that Defendants-Appellees are not successful at selling all of their crop for seed[11] does not make the growing of a crop for seed any less their occupation. One operating a corner gas station has the vending of gasoline as a primary occupation, whether the station's tanks are emptied each month or not. Kunkle Farms is selling seeds on a large scale in direct competition with Asgrow. To interpret the right to save seed exemption to protect an organization such as Kunkle Farms as one whose primary farming occupation is the growing of crops for sale for other than reproductive purposes makes a mockery of the protection intended by Congress in passing the PVP Act.

The District Court interpreted the right to save seed exemption erroneously through its mechanical evaluation of the percent of harvest sold as seed to determine the qualification under the right to save seed exemption. Thus, contrary to the holding of the court, when the right to save seed exemption is properly interpreted, Asgrow has established a strong likelihood of success on the merits.

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[11] As a practical matter, it is <u>impossible</u> to do so, regardless of demand and weather, because of damage to seeds during storage.

C. The Equitable Considerations

The District Court's erroneous interpretation of the PVP Act in considering the issue of likelihood of success on the merits infected its evaluation of the equitable issues of irreparable harm to the plaintiff, harm to the defendant and the public interest.

1. Irreparable Harm

With respect to irreparable harm to the plaintiff, the decision of this court in Robertson is instructive. As noted at pages 1929-30:

> In matters involving patent rights, irreparable harm has been presumed when a clear showing has been made of patent validity and infringement. Smith International, 718 F.2d at 1581, 219 USPQ at 692. This presumption derives in part from the finite term of the patent grant, for patent expiration is not suspended during litigation and the passage of time can work irremedial harm....The nature of the patent grant thus weighs against holding that monetary damages will suffice to make the patentee whole, for the principal value of a patent is its statutory right to exclude.

As discussed previously, the Plant Variety Protection Act is quite similar to the patent statute. The considerations set forth in Robertson with respect to patents apply fully to plant variety protection. Thus, Asgrow is entitled to a presumption of irreparable harm. Although the presumption of irreparable harm may be rebutted, there is no showing of any factors such as those seen in T. J. Smith and Nephew Ltd. v. Consolidated Medical

Equipment, Inc., ___ F.2d __, 3 USPQ 2d 1316, 1318 (Fed. Cir. 1987).

Moreover, the harm to Asgrow is actual, not presumptive. Monetary damages will not suffice to make Asgrow whole in view of the long range planning and ordering that must be carried out by Asgrow and its distributors. Monetary damages will not restore to Asgrow the confidence of its distributors, which stands to be lost through continued infringement.

2. The Balance of Harm

The District Court's analysis of the harm to the defendant is similarly flawed. Preliminary injunctions are intended to preserve the status quo while the trial is conducted. As noted in Robertson, "when the movant has shown the likelihood that the acts complained of are unlawful,[12] the preliminary injunction 'preserves the status quo if it prevents future trespasses but does not undertake to assess the pecuniary or other consequences of past trespasses.'" Robertson, at pg. 1930, citing Atlas Powder Co. v. Ireco Chemicals, 773 F.2d 1230, 1232, 227 USPQ 289, 291 (Fed. Cir. 1985). A preliminary injunction in the present case would serve precisely that function. No penalty would be inflicted on Defendants-Appellees for past misdeeds; only further trospass would be prevented.[13] The soybeans of protected

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[12] The acts of Kunkle Farms are unlawful, as demonstrated supra.

[13] Kunkle Farms fully intends to continue its infringing activities. App. 141-142.

varieties held by Kunkle Farms are perfectly suited for non-infringing uses, i.e., sale as commodities instead of as seed in competition with Asgrow, and after all it is Defendants'-Appellees' position that this is the "primary farming occupation" of Kunkle Farms.

Furthermore, Defendants-Appellees are not innocent infringers. The Defendants-Appellees knowingly grow protected varieties of soybeans for sale as seed. A party undertaking infringing activities while tailoring its efforts to attempt to find a narrow exemption cannot be heard to complain about having its infringing activities terminated when its efforts have fallen wide of the mark. Cf. Windsurfing International, Inc. v. AMF, Inc., 782 F.2d 995, 1003 n. 12, 228 USPQ 562, 568 n.12 (Fed. Cir. 1986); Smith International, Inc. v. Hughes Tool Co., 718 F.2d 1573, 1581, 219 USPQ 686, 692-3 (Fed. Cir. 1983), cert. denied, 464 U.S. 996, 220 USPQ 385 (1983). A preliminary injunction would work no undue hardship on Defendants-Appellees.

3. The Public Interest

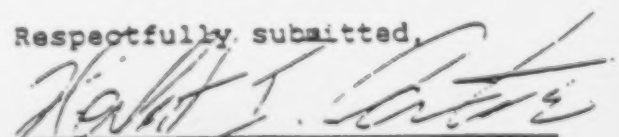
In evaluating the public interest, the District Court noted that Kunkle Farms sells the Asgrow varieties at lower prices than can be obtained from authorized Asgrow dealers, thus benefitting farmers. However, this flies in the face of Congressional intent. Congress specifically considered the possibility of higher prices in enacting the PVP Act. Congress determined that the public interest is best served through the encouragement of

the development of new varieties of plants, and higher prices would be more than balanced by the benefits obtained thereby. See the statement of Rep. Poague quoted by the Fifth Circuit in Delta at page 1016, reproduced supra at page 18. Thus, the District Court's analysis is in direct conflict with the intent of Congress. Cf. Eli Lilly & Co. v. Premo Pharmaceutical Lab., 630 F.2d 120, 137-8 (3d Cir. 1980).

VI. CONCLUSION

Asgrow has invested years of effort and millions of dollars to develop high performing soybean varieties, relying on exclusive rights granted by Congress in the PVP Act to allow it to recoup the resources expended in development. Kunkle Farms sells large quantities of protected seed to numerous farmers over a large geographic area, in competition with Asgrow. The District Court's interpretation of the right to save seed exemption of the Act allows Defendants-Appellees to circumvent the intent of Congress through a charade which must not be permitted if meaningful protection is to be provided under the PVP Act to developers of new plant varieties. The decision of the District Court should, therefore, be reversed and the case remanded to the District Court with instructions to enter a preliminary injunction.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that two copies of the foregoing BRIEF OF APPELLANT were mailed, postage prepaid, this 17th day of August, 1987, to:

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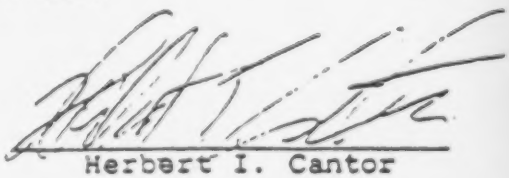

Herbert I. Cantor

ADDENDUM A

informational, and educational activities. The conferees have adopted the language contained in section 1008, which prohibits the use of such funds for abortion, in order to make clear this intent. The legislation does not and is not intended to interfere with or limit programs conducted in accordance with State or local laws and regulations which are supported by funds other than those authorized under this legislation.

HARLEY O. STAGGERS,
JOHN JARMAN,
PAUL G. ROGERS,
TIM LEE CARTER,
JAMES F. HASTINGS,
Managers on the Part of the House.

PLANT VARIETY PROTECTION ACT

P.L. 91-577, see page 1793

Senate Report (Agriculture and Forestry Committee) No. 91-1138, Aug. 21, 1970 [To accompany S. 3070]

Senate Report (Judiciary Committee) No. 91-1246, Sept. 29, 1970 [To accompany S. 3070]

House Report (Agriculture Committee) No. 91-1605, Oct. 13, 1970 [To accompany S. 3070]

Cong. Record Vol. 116 (1970)

DATES OF CONSIDERATION AND PASSAGE

Senate October 2, 1970

House December 8, 1970

The House Report is set out.

HOUSE REPORT NO. 91-1605

THE Committee on Agriculture, to whom was referred the bill (S. 3070) to encourage the development of novel varieties of sexually reproduced plants and to make them available to the public, providing protection available to those who breed, develop, or discover them, and thereby promoting progress in agriculture in the public interest, having considered the same, report favorably thereon without amendment and recommend that the bill do pass.

PURPOSE

This bill provides for the issuance of "certificates of plant variety protection" assuring the developers of novel varieties of sexually reproduced plants of exclusive rights to sell, reproduce, import, or export such varieties, or use them in the production (as distinguished from the development) of hybrids or different varieties, for a period of 17 years. A Plant Variety Protection Office would be established in the Department of Agriculture

to administer the law. Similar protection is now provided for asexually reproduced varieties through patents issued by the Patent Office.

Under patent law, protection is presently limited to those varieties of plants which reproduce asexually, that is, by such methods as grafting or budding. No protection is available to those varieties of plants which reproduce sexually, that is, generally by seeds. Thus, patent protection is not available with respect to new varieties of most of the economically important agricultural crops, such as cotton or soybeans.

NEED FOR THE LEGISLATION

The benefits derived through provision of legal protection for plant varieties have been amply demonstrated in Western Europe where such protection has led to a great flowering of plant breeding, with the concomitant benefits of a more productive national agriculture and improved agricultural export. In the United States, where legal protection for plant varieties is not now available, the committee believes all of the following benefits may be expected from providing such protection:

1. It will greatly stimulate private plant breeding.
2. It will allow our Government agricultural experiment stations to increase their efforts on needed basic research.
3. It would permit public expenditures for applied plant breeding to be deviated to important areas which industry may not pursue.
4. It will give farmers and gardeners more choice, and varieties which are better in yield or in quality, and so forth.
5. It will make American agricultural products more competitive in world markets.
6. Consumers and other purchasers of crops will benefit: in some instances by improved quality, in others by aiding the production needed to serve them.

An explanatory word or two on these foreseen benefits may be in order.

The new law will definitely stimulate plant breeding. Experience in England provides a good case history. Prior to the enactment of its Plant Varieties and Seeds Act 1964, little plant breeding was done in England by private companies, and not much was done by government agencies. Since the new law came into effect, there has been a great upsurge of plant breeding, and a once moribund seed industry is now showing signs of great new vitality.

Prior to the Plant Patent Act of 1930, there was very little private plant breeding done aside from that performed by a handful of amateurs or hobbyists. Since then, some 2,700 plant patents have been issued, largely to commercial breeders. It is difficult to estimate the total value of the fruits, nuts, cut flowers, and ornamentals deriving from patented varieties, but some insight into the value of this commerce may be obtained by considering the case of roses. It is estimated that 50 million rose plants, over 80 percent of which are from patent varieties, are sold to home gardeners in the United States each year. These plants have an estimated wholesale value of $35 million. Additionally, there are some 20 million rose plants grown in U. S. greenhouses. More than 90 percent of these are of patented

varieties and the flowers produced from them are estimated to have a commerical value in excess of $50 million.

The availability of legal protection for plant varieties will allow our Government experiment stations to concentrate more of their efforts on greatly needed basic research. Plant breeding is becoming an ever more sophisticated science. If the United States is to continue to keep pace with developments elsewhere, our scientific institutions must constantly search out the new genetic techniques and properties which can be incorporated into the overall American plant breeding effort. Private seedsmen cannot afford to do this kind of research. The public institutions are well equipped for such investigations.

The availability of protection for plant breeders should increase the benefits from public expenditures where they continue to be used for applied plant breeding. Many public institutions today spend sizable sums of money on the development of finished plant varieties. Once released, these experiment station varieties are made available to all. Advertising and marketing such varieties is often not attractive. Within a short time, many of those which are marketed disappear from the market because those who handle them learn they cannot make the kind of return on their investment needed to allow them to continually handle such varieties.

Legal protection for plant varieties will give American farmers the choice of more and better varieties. Many experiment station varieties are short lived on the market. This knowledge has tended to discourage public institutions from applied plant breeding. The result is that farmers today are not being offered enough choices and not enough work is being done on some of our most important crops. Soybeans provide a good example of a crop that could and would be more productive as a result of the more and better varieties which would be made available as a result of legal protection for plant varieties. Other major U. S. crops, like cotton, wheat, barley, oats, and rice, for example, now largely ignored by the private researchers, would almost certainly benefit greatly from the impact of a competitive, private plant breeding effort.

Legal protection for plant varieties should make U. S. agricultural products more competitive in world markets. Higher crop yields help reduce per unit costs of the finished product, be it meat, milk, food, or fiber. Clear examples of this may be seen by noting the dramatic increase in yields of just two crops—corn and sorghum—which, as a result of their adaptation to hybridization, have been the object of keen competition among private plant breeders of this country.

PUBLIC HEARINGS—COMMITTEE ACTION

Public hearings were held on June 10, 1970, by the Subcommittee on Departmental Operations on H.R. 13424 by Mr. Gubser; H.R. 13631 by Messrs. Purcell, Horton, Leggett, Hungate, Teague of Texas, Dorn, Abernethy, Fisher, Talcott, Biester, Hansen of Idaho, Winn, Scherle, Daddario, Mahon, Mrs. Reid of Illinois, Zablocki, Smith of Iowa, Michel, Montgomery, Brown of Ohio, Gonzalez, Teague of California, and Mrs. May; H.R. 13658 by Messrs. Purcell, Reuss, Wyatt, MacGregor, and Quie; H.R. 13901 by Mr. Arends; H.R. 14332 by Mr. Frey; and H.R. 15226 by

Mr. McCloskey; all of which are substantively similar to the measure under consideration, S. 3070. The full committee on October 13, 1970, by a vote of 16–2 ordered the Senate-passed bill reported.

COMMITTEE INTENT

During the consideration of S. 3070 the committee discussed several suggestions for establishing a method of providing useful information about the milling and baking characteristics of wheat.

It was brought to the committee's attention that wheat producers in the past have had some very expensive and unfortunate experiences with poor quality wheat about which they did not have necessary information as to end use characteristics before they committed themselves to producing it.

The committee considered various amendments which were designed to meet this problem, but did not adopt them only because it felt the Secretary could (and should) meet this problem administratively under the provisions of the legislation.

Section 41(a) (1) specifically refers to milling and baking characteristics of wheat or an example of "distinctiveness" in arriving at the definition of the term "novel variety".

Therefore, it is the committee's intent that the Secretary shall to the maximum extent practicable, provide information concerning the milling and baking characteristics of wheat. It is also the committee's intent that such information be made available to the public and that it include as many processing and product characteristics as is feasible.

SECTION-BY-SECTION EXPLANATION

TITLE I—PLANT VARIETY PROTECTION OFFICE

CHAPTER 1.—ORGANIZATION AND PUBLICATIONS

Section 1. Establishment.—This section establishes a Plant Variety Protection Office in the Department of Agriculture.

Section 2. Seal.—This section provides that the Plant Variety Protection Office shall have a seal with which documents and certificates evidencing plant variety protection shall be authenticated.

Section 3. Organization.—This section authorizes the Secretary of Agriculture to determine the organization of the Plant Variety Protection Office.

Section 4. Restrictions on Employees as to Interest in Plant Variety Protection.—This section makes employees of the Plant Variety Protection Office ineligible to apply for plant variety protection or to acquire (except by inheritance or bequest) any interest in any matters before that office. This section does not apply to members of the Plant Variety Protection Board who are not otherwise employees of the office.

Section 5. Bond of employees.—This section requires surety bonds from such employees as may be designated by the Secretary to secure the faithful discharge of their duties.

Section 6. Regulations.—This section authorizes the Secretary to establish regulations for the conduct of proceedings in the office.

Section 7. Plant Variety Protection Board.—This section provides for a Plant Variety Protection Board to advise the Secretary concerning regulations and on all appeals from the examiner, and to advise the Secretary on declaring a protected variety open to public use for reasonable royalties under section 44. The board would consist of such number of members as the Secretary might appoint. They would be persons expert in various areas of varietal development covered by the act and would be drawn approximately equally from the private or seed industry sector and from the sector of Government or the public. The Secretary or his designee would act as chairman without vote except in the case of ties.

Section 8. Library.—This section provides for the maintenance of a library to aid the officers in the discharge of their duties.

Section 9. Register of Protected Plant Varieties.—This section requires the Secretary to maintain a register of published specifications of United States protected plant varieties.

Section 10. Publications.—This section authorizes the Secretary to publish plant variety protection specifications; the Official Journal of the Plant Variety Protection Office; and laws, rules of practice, or other publications relating to the business of the office. It also authorizes him to establish public facilities for record searches, disseminate information, and exchange publications, specifications and certain other materials for similar materials.

Section 11. Copies for Public Libraries.—This section authorizes the Secretary to supply copies of specifications, drawings, and photographs of protected varieties to public libraries in the United States.

CHAPTER 2.—LEGAL PROVISIONS AS TO THE PLANT VARIETY PROTECTION OFFICE

Section 21. Day for Taking Action Falling on Saturday, Sunday, or Holiday.—This section provides that when the office is closed on a day that any action is to be taken, the action may be taken on the next succeeding business day.

Section 22. Form of Papers Filed.—This section authorizes the Secretary to prescribe the form of papers to be filed in the office.

Section 23. Testimony in Plant Variety Protection Office Cases.—This section provides for the taking of affidavits and depositions by any officer authorized to take depositions for use in the courts or by any hearing officer acting by authority of the Secretary.

Section 24. Subpenas, Witnesses.—This section provides for issuance of subpenas, witness fees, and enforcement through judicial contempt procedures. Subpenas would be issued upon the application of any party by the clerk of any U. S. court for the district wherein the testimony is to be taken for any witness residing or being within such district or within 100

miles of the hearing site. Every witness subpoenaed or testifying would be allowed fees and traveling expenses as in U. S. district courts.

Section 25. Effect of Defective Execution.—Defectively executed documents may be provisionally accepted by the Secretary provided a properly executed document is submitted within such time as may be prescribed.

Section 26. Regulations for Practice Before the Office.—This section authorizes the Secretary to regulate practice before the office.

Section 27. Unauthorized Practice.—This section provides for actions for return of money paid them, civil damages, and injunctions against persons guilty of unauthorized practice before the office. The principal effect of the section insofar as a remedy for damage is concerned is to place the burden of proof on the unauthorized practitioner to show that the work was done competently and without negligence.

This section exempts any authorized practitioner from liability for damages if he establishes that the work was done competently and without negligence. The section is not applicable to a person who, without a claim of self-sufficiency, works under the supervision of another who is admitted to practice and the responsible party, nor to anyone who establishes that he acted only on behalf of any employer by whom he was regularly employed.

CHAPTER 3.—PLANT VARIETY PROTECTION FEES

Section 31. Plant Variety Protection Fees, Appropriations.—This section would provide for the collection of reasonable fees established by the Secretary to cover substantially all costs of administration; provide for their deposit in a revolving fund which would be available for administration of the act; and provide for a $50 filing fee pending establishment of fees by the Secretary.

Section 32. Payment of Plant Variety Protection Fees; Return of Excess Amounts.—This section provides for payment of fees to the Secretary and refund of any sum paid by mistake.

TITLE II—PROTECTABILITY OF PLANT VARIETIES AND CERTIFICATES OF PROTECTION

CHAPTER 4.—PROTECTABILITY OF PLANT VARIETIES

Section 41. Definitions and Rules of Construction.—Subsection (a) defines "novel variety" as one differing in any characteristic from all prior varieties, possessing uniformity to the extent that any variations are predictable and commercially acceptable, and having reasonable stability.

Subsection (b) defines "United States" to include territories, possessions, and the Commonwealth of Puerto Rico.

Subsection (c) defines "kind" as one or more related species or subspecies known by a common name, such as soybeans, flax, carrot, or radish.

Subsection (d) defines "date of determination" as the date of at least tentative determination that the variety has been sexually reproduced

with recognized characteristics making it a novel variety, whether or not the novelty thereof has been determined. This is intended to require that the variety has been determined to possess the characteristics which make it novel, even though the novelty of such characteristics is not established until a later date.

Subsection (e) defines "breeder" to make it clear that the person directing the final breeding creating the novel variety, or discovering the novel variety, or the principal of such person if he is acting for a principal, is to be considered the breeder.

Subsection (f) defines "sexually produced" to include any production by seed.

Subsection (g) defines the term "basic seed" as the seed planted to produce certified or commercial seed.

Subsection (h) defines the term "testing" to provide for a period prior to the first sale of the variety during which it can be tested without becoming a public variety.

Subsection (i) defines "public variety." Public varieties are not subject to protection under the bill. Since they are public property no exclusive rights can be obtained.

Subsection (j) provides that a variety shall be "effectively available to workers in this country" within the meaning of section 42(1)(B) if a source from which the variety can be purchased is indicated in the publication described in section 42(1) (B) or readily determinable or if the publication teaches how to produce the variety from source material available to workers in this country. Varieties covered by section 42(1) (B) are in the public domain, so exclusive rights in them cannot be obtained under the bill.

Section 42. Right to Plant Variety Protection; Plant Varieties Protectable.—Under this section the breeder of any novel variety of sexually reproduced plants (except fungi, bacteria, and hybrids) or his successor in title is entitled to plant variety protection therefor unless—

(1) before the date of determination by the breeder, or more than one year before the effective filing date of the application for protection the variety was (A) a public variety in this country or (B) effectively available to workers in this country and adequately described by a publication reasonably deemed a part of the public technical knowledge in this country, which description must include a disclosure of the principal characteristics by which the variety is distinguished; or

(2) an application for protection based on the same breeder's acts was filed in a foreign country by the proprietor or his privies more than one year before the effective filing date actually in the United States; or

(3) another is entitled to an earlier date of determination and such other has continued a program of development and testing toward commercialization, or within six months of such earlier date publishes in the manner just described in (1) (B).

The Secretary could, by regulation, permit late filing (more than 1 year after a sale of the variety) in appropriate cases. An example of such a case might be where filing was delayed by a postal strike, as recently occurred in the case of patent applications.

Section 43. Reciprocity Limits.—Protection may be limited by regulation to U. S. nationals, except that

(1) this limitation does not apply where it would violate a treaty, and

(2) nationals of a foreign state in which they are domiciled will be entitled to so much of the protection here afforded as is afforded to U. S. nationals for the same genus and species.

Section 44. Public Interest In Wide Usage.—When necessary to insure an adequate supply of fiber, food, or feed in this country, the Secretary may declare a protected variety open to use for a reasonable royalty to the owner for up to 2 years.

CHAPTER 5.—APPLICATIONS: FORM, WHO MAY FILE, RELATING BACK, CONFIDENTIALITY

Section 51. Application for Recognition of Plant Variety Rights.—An application may be filed by the owner of the variety. An error in naming the breeder may be corrected at any time.

Section 52. Content of Application.—The application must contain the name and description of the variety, its genealogy and breeding procedure if known, a declaration that a viable sample of basic seed will be kept in a public repository, and a statement of the basis of the applicant's ownership.

Section 53. Joint Breeders.—One joint breeder may apply, naming the others. The certificate may be issued to such of the joint breeders as join in the application.

Section 54. Death or Incapacity of Breeder.—Legal representatives may apply in behalf of deceased or legally incapacitated breeders.

Section 55. Benefit of Earlier Filing Date.—An application is to be deemed filed on the earliest of the following dates:

(1) the date actually filed;

(2) the earliest date of filing in a foreign country which affords similar privileges in the case of applications filed in the United States by citizens of the United States, if the U. S. application was filed within 12 months thereafter;

(3) the earliest date of filing in the United States which has been continuously succeeded by applications filed before the issuance of a certificate or other termination of proceedings on a pending prior application.

Section 56. Confidential Status of Application.—This section requires applications to be kept confidential.

Section 57. Publication.—This section authorizes the Secretary to establish regulations for the publication of any pending application at the request of the owner.

CHAPTER 6.—EXAMINATION, RESPONSE TIME, INITIAL APPEALS

Section 61. **Examination of Application.**—This section provides for the examination of applications.

Section 62. **Notice of Refusal; Reconsideration.**—When an application is refused or an objection or requirement is made by the examiner, the Secretary is to notify the applicant. If, after receiving such notice, the applicant requests reconsideration, with or without amendment, the application shall be reconsidered. The applicant is allowed 6 months to take appropriate action after an adverse action, or such other time as the Secretary may set, plus upon payment of an additional fee an additional 3 months. The Secretary could set a shorter time than 6 months only in exceptional circumstances. The provision for a 3-month extension upon payment of an additional fee is designed to permit an applicant to avoid the time and trouble involved in obtaining an extension where he is willing to pay the fee.

Section 63. **Initial Appeal.**—When an application is refused by the examiner, an applicant may appeal to the Secretary who is required to seek the advice of the Plant Variety Protection Board.

CHAPTER 7.—APPEALS TO COURTS AND OTHER REVIEW

Section 71. **Appeals.**—From decisions made under sections 44, 63, 91, 92, and 128, appeal may be taken under the Federal Rules of Appellate Procedure. The Court of Customs and Patent Appeals and the U. S. Courts of Appeal shall have jurisdiction.

Section 72. **Civil Action Against Secretary.**—An applicant dissatisfied with a decision under section 63 or section 91 (which deals with reexamination after issue) may, as an alternative to appeal, have remedy by civil action against the Secretary in the U. S. District Court for the District of Columbia. In reviewing a Secretary's decision refusing plant variety protection, the court may adjudge the applicant entitled to such protection on compliance with the requirements of the act.

Section 73. **Appeal or Civil Action in Contested Cases.**—This section provides for a remedy by civil action as an alternative to appeal under section 71, for any party to a priority contest under section 92. A party contemplating an appeal is required to notify all adverse parties of his intention, and any adverse party except the Secretary may, by notice served within 10 days of the notice to him, elect that any review shall be by civil action.

CHAPTER 8.—CERTIFICATES OF PLANT VARIETY PROTECTION

Section 81. **Plant Variety Protection.**—This section provides for issuance of a certificate of plant variety protection after a finding of entitlement and payment of fees.

Section 82. How Issued.—This section deals with the formalities of issuing and recording certificates.

Section 83. Contents and Terms of Plant Protection.—The certificate is to certify that the breeder has the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or using it in producing (as distinguished from developing) a hybrid or different variety therefrom to the extent provided by this act. At the election of the owner the certificate shall specify that seed of the variety shall be sold by variety name only as a class of certified seed and conform to the number of generations designated by the owner. The term of plant variety protection shall expire 17 years after the date of issue of the certificate, except that the Secretary may shorten the term by the amount of delay attributed to the applicant if the certificate is not issued within 3 years from the effective filing date. If the owner fails to comply with regulations relating to replenishing seed in a public repository, the certificate shall expire after notice and further failure to comply with the regulations within the time allowed thereafter (at least 3 months).

Section 84. Certificate of Correction of Plant Variety Protection Office Mistake.—This section provides for corrections of mistakes in certificates of plant variety protection clearly disclosed by the records of the Plant Variety Protection Office. This section gives more full relief than section 85. Under this section the correction of a Government mistake has effect from the date of issuance of the original certificate. Under section 85 correction of a mistake of the applicant only takes effect upon correction.

Section 85. Certificate of Correction of Applicant's Mistake.—This section provides for correction of good faith mistakes which are not the fault of the Office of Plant Variety Protection.

Section 86. Correction of Named Breeder.—This section provides that an error as to the naming of a breeder in an application shall not affect validity of plant variety protection and may be corrected at any time without depriving any person of any rights he otherwise would have had.

CHAPTER 9.—REEXAMINATION AFTER ISSUE, AND CONTESTED PROCEEDINGS

Section 91. Reexamination After Issue.—This section authorizes the Secretary to cause plant variety protection to be reexamined upon written notice by any person within 5 years after issuance of a certificate of facts which may have a bearing on the protectability of the variety.

Section 92. Priority Contest.—Where two applications of different applicants may be based on the same variety, the Secretary may—

(1) Initiate a priority contest, or

(2) Issue a certificate on the application having the earliest effective filing date, or

(3) Issue a certificate naming both proprietors as alternative owners. Where one applicant is named owner or alternative owner, the Secretary

shall institute a priority contest upon the timely request of another applicant for protection for the same variety.

Section 93. Effect of Adverse Final Judgment or of Nonaction.—A final judgment of a priority contest, if adverse to an application and not appealed, shall constitute cancellation of any certificating on that application.

Nonaction or an adverse decision on a reexamination or priority contest shall not prejudice defense of an infringement suit or affirmative relief for a declaratory judgment. Thus a person having knowledge which may invalidate a certificate is not forced to enter a fight which may not settle the question anyway. He may go to court on it, if facts justify a suit for declaratory judgment. Or he may wait until there is more need to take such action, or until he is sued for infringement.

Section 94. Interfering Plant Variety Protection.—This section provides for a civil action by the owner of a certificate of plant variety for protection against another owner of a certificate for the same variety, and the court may adjudge the validity of the respective certificates, or the ownership of the certificate. Determining ownership is especially applicable to a certificate issued jointly to rival claimants under section 92(a) (3).

TITLE III—PLANT VARIETY PROTECTION AND RIGHTS

CHAPTER 10.—OWNERSHIP AND ASSIGNMENT

Section 101. Ownership and Assignment.—This section provides that plant variety protection shall have the attributes of personal property; that applications, or any interest in a variety, shall be assignable in writing; and that assignments shall be void against a subsequent purchaser or mortgagee for a valuable consideration, without notice, unless recorded within 1 month from its date or at least 1 month prior to the date of such subsequent purchase or mortgage. This section also provides that specified forms of acknowledgment shall constitute prima facie evidence of an assignment.

Section 102. Ownership during testing.—This section provides a remedy against any person who, with notice of the owner's interest, diverts from authorized testing, or retains without authorization, seed or other sexually reproducible plant material which the owner has not made available to the public.

CHAPTER 11.—INFRINGEMENT OF PLANT VARIETY PROTECTION

Section 111. Infringement of plant variety protection.—This section sets out what shall amount to infringement of plant variety protection. Generally an infringement is the unauthorized exercise of a right given exclusively to the proprietor by a certificate of plant variety protection under section 83. However, this section is broader than section 83 in some respects and narrower in others. Since a remedy is provided for an infringement, the enforceable rights accorded by the bill are governed

by this section. Infringement can occur before a certificate of plant variety protection is issued when a novel plant variety has been distributed with notice that propagation is prohibited. This more resembles copyright law than patent law. Justification for this may be found partly in the fact that infringement is expected almost never to be by independent work, but by willful reproduction starting from the protected variety itself.

The following acts performed without authority of the owner of the variety constitute infringement:

(1) any transfer of title or possession, or offer to buy or sell, the novel variety;

(2) importation or exportation of the novel variety;

(3) sexual multiplication as a step in marketing the variety;

(4) use of the novel variety in producing (as distinguished from developing) a hybrid or different variety;

(5) use of seed marked "propagation prohibited" or progeny thereof to propagate the novel variety;

(6) dispensation of the novel variety to another without notice that it is a protected variety;

(7) performance of any of the foregoing in which the variety is multiplied asexually (except pursuant to a plant patent); or

(8) inducing any of the foregoing.

Producing (as distinguished from developing) a hybrid or different variety means that use of the protected variety in producing the commercial class of seed of a variety constitutes infringement. Use of the protected variety as one source of germ plasm to breed a novel variety is permissible. As an example, the use of a protected inbred line of corn to cross it with another inbred line to produce a hybrid for commercial use, or production of a composite variety which is repeatedly reconstituted for commercial sale by intercrossing a set of seed lines one of which is protected, shall constitute an infringement. The use of such inbred line for hybridization with other materials to develop through breeding a novel inbred line as provided in section 114, however, does not constitute infringement; nor does the production of such new inbred line for the general market constitute infringement.

Section 112. **Grandfather Clause.**—Section 112 would protect a person who developed and produced a variety more than 1 year prior to the effective filing date of an adverse application, and his successor in interest, in his right to reproduce and sell such variety.

Section 113. **Right to Save Seed. Crop Exemption.**—This section authorizes a farmer to sell the crop produced from a protected variety for other than reproductive purposes; to save seed from such crop for future use or planting on the farm; or, if his primary farming occupation is the growing of crops for sale for other than reproductive purposes, to sell such saved seed for reproductive purposes to other persons so engaged.

Section 114. **Research Exemption.**—Use and production for research is not to constitute infringement.

Section 115. Intermediary exemption.—This section exempts carriers and advertising companies acting in the ordinary course of their business from infringement actions.

CHAPTER 12.—REMEDIES FOR INFRINGEMENT OF PLANT VARIETY PROTECTION, AND OTHER ACTIONS

Section 121. Remedy for infringement of plant variety protection.—A remedy by civil action is provided for infringement. Sale under the name of the protected variety constitutes a prima facie presumption that the variety sold is the same as that protected.

Section 122. Presumption of validity; defenses.—This section provides that certificates of plant variety protection shall be presumed valid. The burden of establishing invalidity rests on the party asserting invalidity. Subsection (b) requires that defenses to infringement actions be pleaded.

Section 123. Injunction.—This section authorizes injunctions to prevent violations of rights protected by the bill.

Section 124. Damages.—Damages for infringement are to be the higher of adequate compensation or a reasonable royalty, together with interest and costs, and the court may increase them up to three times the amount determined.

The court is to have discretion as to awarding damages where it finds the infringer has established innocent intentions and the infringement occurred prior to issuance of a certificate.

Section 125. Attorneys Fees.—In exceptional cases the court may award reasonable attorneys fees to the prevailing party.

Section 126. Time Limitation on Damages.—Infringement actions must be brought within 6 years after the infingement (or within 3 years after the owner learns of the infringement). Nothing in this section would prevent application of the doctrine of laches, which might result in the earlier barring of an action. In infringement cases against the United States, the period between receipt by the appropriate agency of a written claim and the mailing of a notice of denial of such claim shall not be counted in determining the period of limitation.

Section 127. Limitation of Damages; Marking and Notice.—No damages can be collected for infringement where a variety is distributed by authority of the owner and is received by the infringer without being marked "Propagation Prohibited" or (after the certificate issues) "U.S. Protected Variety", unless the infringer has actual knowledge that propagation is prohibited or that the variety is a protected variety.

Section 128. False Marketing, Cease and Desist Orders.—This section prohibits falsely representing that plant material is a U.S. protected variety or that an application for plant protection is pending. Use of the phrase "propagation prohibited" or similar phrase without reasonable basis is also prohibited. No reasonable basis exists for use of the phrase after it has been used for a year after testing has been completed, unless an ap-

plication is pending or a certificate is in force. This section is enforcible by cease and desist order and civil damages.

Section 129. Nonresident Proprietors; Service and Notice.—This section provides for service of process on nonresident owners.

CHAPTER 13.—INTENT AND SEVERABILITY

Section 131. Intent.—This section recites the constitutional basis for the bill, principally the commerce and patent powers.

Section 132. Severability.—This section provides that if the bill is held unconstitutional as to some provisions or circumstances it shall remain in force as to the remainder.

CHAPTER 14.—TEMPORARY PROVISION AND RELATED ENACTMENTS; MISCELLANEOUS

Section 141. Effective Date.—The bill would be effective upon enactment.

Section 142. Amendment of Federal Seed Act.—This section adds a new title V to the Federal Seed Act to prohibit sale by variety name of seed which is required by a certificate of plant variety protection to be sold only as certified seed and which is not so certified.

This section also amends section 102 of the Federal Seed Act to provide that, when required by a certificate of plant variety protection, seed of the protected variety shall be certified only when the basic seed from which a variety was produced was furnished by authority of the owner of the variety, and shall conform to the number of generations designated by the certificate.

Section 143. Amendment of Judicial Code.—This section gives the Court of Customs and Patent Appeals and the courts of appeals jurisdiction of appeals under section 71 of the bill.

Section 144. Short Title.—This section provides a short title for the bill "Plant Variety Protection Act."

DEPARTMENTAL VIEWS

Department of Agriculture supports the objectives of the bill, but reserves comment on its specific provisions pending completion of an administration study of the laws protecting proprietary rights in the United States. Its report is as follows:

DEPARTMENT OF AGRICULTURE,
Washington, D. C., June 10, 1970.

Hon. ALLEN J. ELLENDER,
Chairman, Committee on Agriculture and Forestry,
U. S. Senate.

DEAR MR. CHAIRMAN: This is in reply to your request of October 24, 1969, for a report on S. 3070, a bill "To encourage the development of novel varieties of sexually reproduced plants and making them available

to the public by making protection available to those who breed, develop, or discover them, thereby promoting progress in the useful art of agriculture."

This Department supports the objective of S. 3070.

We believe that it is desirable to provide incentive for private enterprise to undertake the research and development required to produce novel varieties of sexually produced plants. The proposed legislation would provide such incentive.

The Department is not prepared at this time to comment on the specific provisions of S. 3070. The administration has under consideration a number of important changes to the laws protecting proprietary rights in the United States. This review will have implications for programs such as the one proposed here. We wish to reserve further comment on the provisions of S. 3070 until we have had an opportunity to evaluate them in the light of the findings of this administration review.

The Bureau of the Budget advises that there is no objection to the presentation of this report from the standpoint of the administration's program.

Sincerely,

J. PHIL CAMPBELL,
Under Secretary.

COST

Although the Department has not submitted a formal estimate on the cost of establishing and maintaining the Plant Variety Protection Office it has indicated that the cost would be inversely proportional to the number of certificate applications processed. The Department estimates that approximately 200 applications per annum will be processed; annual operational costs of $275,000 would be realized at that level of activity. If, however, 500 applications were to be processed the annual costs would be but $485,000.

PACIFIC ISLANDS TRUST TERRITORY—CIVIL GOVERNMENT

P.L. 91-578, see page 1811

Senate Report (Interior and Insular Affairs Committee)
No. 91-867, May 14, 1970 [To accompany S. 3479]

House Report (Interior and Insular Affairs Committee)
No. 91-1399, Aug. 10, 1970 [To accompany H.R. 15978]

Cong. Record Vol. 116 (1970)

DATES OF CONSIDERATION AND PASSAGE

Senate May 13, September 29, 1970

House September 14, December 9, 1970

The Senate bill was passed in lieu of the House bill after substituting for its language much of the text of the House bill.

The House Report is set out.

HOUSE REPORT NO. 91-1399

THE Committee on Interior and Insular Affairs, to whom was referred the bill (H.R. 15978) to amend section 2 of the act of June 30, 1954, as

APPENDIX C

SURVEY OF BIOTECHNOLOGY COMPANIES SEED COMPANIES, UNIVERSITIES AND NURSERIES

A questionnaire was distributed to 54 biotechnology companies, seed industry companies, universities and nurseries. Responses have been received from 39 of these as identified herein. The questionnaire addresses the concerns and issues regarding intellectual property protection for plants and varieties in general and utility patents for plants in particular.

Survey I illustrates all of the responses we received. A numeric value was assigned to each response, with "Strongly Agree" = 5 points, "Agree" = 4 points, "No Opinion = 3 points, "Disagree" = 2 points, and "Strongly Disagree" = 1 point. The mean value for each question is listed in Survey II under the categories of (1) overall (mean value across all responses), (2) biotechnology companies, (3) seed industry companies, (4) universities, and (5) plant nurseries. All written responses are organized by type of business (e.g., seed company) and follow Survey II.

Biotechnology Companies

Agracetus

Biosource

Calgene

EniChem Americas Inc.

Molecular Genetics, Inc.

Monsanto Corporation

NPI

Plant Genetics, Inc.

Sungene Technologies Corporation

Seed Companies

Agricultural Alumni Seed Improvement Association

Agrigenetics Corporation

Cal/West Seeds

Cargill, Inc.

Dekalb-Pfizer Genetics

Edw. J. Funk & Sons, Inc.

Garst Seed Company

Holden's Foundation Seeds, Inc.

Hoegemeyer Hybrids

Illinois Foundation Seeds, Inc.

J.G. Limited, Inc.

Mike Brayton Seeds, Inc.

Nickerson American Plant

Northrup King Co.

Petoseed Company, Inc.

Pioneer Hi-Bred International, Inc.

United Agriseed, Inc.

The Upjohn Company

W. Atlee Burpee

Wyffels Hybrids, Inc.

Universities

University of Illinois

Iowa State University

University of Minnesota

Ohio State University

Purdue University

Rutgers University

University of Wisconsin

Plant Nurseries

The Conrad-Pyle Co.

Jackson & Perkins Co.

Mikkelsens, Inc.

SURVEY I	Strongly Agree (5)	Agree (4)	No Opinion (3)	Disagree (2)	Strongly Disagree (1)
1. The following types of protection have been beneficial, or will become beneficial, for your business/university:					
(a) Plant Variety Protection (PVP Certificates)	18	19	2	4	
(b) Plant Utility Patents	21	7	3	5	2
(c) Trade Secrets	17	11	4	4	1
(d) Plant patents (asexually reproduced plants)	14	8	11	5	
2. The following types of protection have not interferred, or will not interfere, in the development of new varieties/inbreds:					
(a) Plant Variety Protection	25	11		2	
(b) Plant Utility Patents	15	6	1	9	7
(c) Trade Secrets	11	10	8	5	4
(d) Plant Patents (asexual)	16	12	9	1	
3. The following types of protection have provided or will provide an incentive to develop new varieties:					
(a) Plant Variety Protection	17	20	1	1	
(b) Plant Utility Patents	24	11	1		1
(c) Trade Secrets	14	15	3	4	
(d) Plant Patents (asexual)	15	15	8		
4. It is important to have both plant variety protection and plant utility patent protection available for new varieties:					
	16	7	3	10	3
5. Plant variety protection and plant patents (asexual) provide adequate protection for new varieties, and thus there is no need for plant utility patents:					
	5	6	3	10	15
6. Compulsory (i.e., mandatory) licensing is needed for the following types of protection to permit development of new varieties:					
(a) Plant Variety Protection	3	1	3	12	19
(b) Plant Utility Patents	7	5	4	8	14

	Strongly Agree (5)	Agree (4)	No Opinion (3)	Disagree (2)	Strongly Disagree (1)
7. Intellectual property protection for plants should be standardized world-wide:					
	15	15	4	4	1
8. I am knowledgeable about the types of intellectual property protection for plants:					
	15	23		1	
9. The following types of protection will be the most effective for your business/university in the future:					
(a) Plant Variety Protection	17	10	6	4	1
(b) Plant Utility Patents	19	9	4	5	1
(c) Trade Secrets	13	15	5	3	2
(d) Plant Patents (asexual)	13	7	11	4	1

10. What concerns do you have regarding intellectual property protection (any type) for plants: (use a separate sheet, if necessary)

11. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university or the general public: (use a separate sheet, if necessary)

We would appreciate it if you would answer the following questions so that we may group the responses and make a proper summary and evaluation of the survey:

12. I am associated with:	Large	Medium	Small
(a) the seed industry	9	2	6
(b) a foundation seed company	2		1
(c) a biotechnology company	3	1	5
(d) a university	7		
(e) a nursery	2		1

13. Please identify which crop(s) or plant species on which you conduct research, or sell as commercial product(s):

14. What approximate percentage of your inbreds or varieties are currently protected, and expected to be protected in 3 to 5 years, by the following types of protection:

	Cross-Pollinated Crops		Self-Pollinated Crops	
	Currently	3-5 Years	Currently	3-5 Years
(a) Plant Variety Protection				
(b) Plant Utility Patents				
(c) Trade Secrets				
(d) Plant Patents (asexual)				
(e) None				

SURVEY II	Overall	Biotechnology Companies	Seed Companies	Universities	Nurseries
1. The following types of protection have been beneficial, or will become beneficial, for your business/university:					
(a) Plant Variety Protection (PVP Certificates)	4.2	3.7	4.5	4.4	3.5
(b) Plant Utility Patents	4.1	4.9	3.5	4.4	4.0
(c) Trade Secrets	4.1	4.2	4.5	2.5	3.7
(d) Plant patents (asexually reproduced plants)	3.8	4.3	3.3	4.4	5.0
2. The following types of protection have not interferred, or will not interfere, in the development of new varieties/inbreds:					
(a) Plant Variety Protection	4.6	4.4	4.6	4.6	5.0
(b) Plant Utility Patents	3.3	4.0	2.8	3.7	4.0
(c) Trade Secrets	3.4	3.6	3.9	2.3	3.3
(d) Plant Patents (asexual)	4.1	4.1	3.9	4.4	5.0
3. The following types of protection have provided or will provide an incentive to develop new varieties:					
(a) Plant Variety Protection	4.4	4.1	4.3	4.6	5.0
(b) Plant Utility Patents	4.5	4.8	4.3	4.7	5.0
(c) Trade Secrets	4.1	4.0	4.3	3.3	4.3
(d) Plant Patents (asexual)	4.2	4.0	4.0	4.6	5.0
4. It is important to have both plant variety protection and plant utility patent protection available for new varieties:					
	3.6	4.1	3.1	3.7	5.0
5. Plant variety protection and plant patents (asexual) provide adequate protection for new varieties, and thus there is no need for plant utility patents:					
	2.4	1.7	2.9	2.1	1.7
6. Compulsory (i.e., mandatory) licensing is needed for the following types of protection to permit development of new varieties:					
(a) Plant Variety Protection	1.9	1.7	1.9	2.0	1.7
(b) Plant Utility Patents	2.6	1.7	3.2	2.3	1.5

	Overall	Biotechnology Companies	Seed Companies	Universities	Nurseries
7. Intellectual property protection for plants should be standardized world-wide:					
	4.0	3.6	4.2	3.7	4.7
8. I am knowledgeable about the types of intellectual property protection for plants:					
	4.3	4.4	4.3	4.1	4.7
9. The following types of protection will be the most effective for your business/university in the future:					
(a) Plant Variety Protection	4.0	3.4	4.1	4.6	3.7
(b) Plant Utility Patents	4.1	4.9	3.6	4.4	4.0
(c) Trade Secrets	3.9	3.9	4.3	2.7	4.0
(d) Plant Patents (asexual)	3.8	3.7	3.2	4.7	5.0

10. What concerns do you have regarding intellectual property protection (any type) for plants: (use a separate sheet, if necessary)

11. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university or the general public: (use a separate sheet, if necessary)

We would appreciate it if you would answer the following questions so that we may group the responses and make a proper summary and evaluation of the survey:

12. I am associated with:	Large	Medium	Small
(a) the seed industry	9	2	6
(b) a foundation seed company	2		1
(c) a biotechnology company	3	1	5
(d) a university	7		
(e) a nursery	2		1

13. Please identify which crop(s) or plant species on which you conduct research, or sell as commercial product(s):

14. What approximate percentage of your inbreds or varieties are currently protected, and expected to be protected in 3 to 5 years, by the following types of protection:

	Cross-Pollinated Crops		Self-Pollinated Crops	
	Currently	3-5 Years	Currently	3-5 Years
(a) Plant Variety Protection				
(b) Plant Utility Patents				
(c) Trade Secrets				
(d) Plant Patents (asexual)				
(e) None				

BIOTECHNOLOGY COMPANIES

A. What concerns do you have regarding intellectual property protection (any type) for plants?

1. Modifying utility patents to require compulsory licensing. United States Patent and Trademark Office "trading off" with foreign offices.

2. Past decisions concerning plant utility patents appear to be moving in the right direction. However, as they do, PVP will become less useful unless we establish better definitions concerning minimum distances between varieties.

3. Patent laws may be modified to treat utility patents for plants differently than other patentable subject matter.

4. Utility patent protection is one of the most significant and positive events in recent history in providing stimulus to new product innovation. Major concerns of "establishment" (e.g., lack of germ plasm, ease of distribution of breeding materials, etc.) are not going to be as significant as some imagine. Unfortunately, the plant breeding rights of PVP and Farmer's exclusion void a significant proportion of the proposed incentive in variety development. Major concern is potential reversal by courts of extension on utility patents to plants. Should have legislation to make sure that does not happen.

5. The principal concerns are directed to the availability and enforceability of utility patent protection for plants. It is extremely critical to the multi-year effort to genetically engineer novel plants and plant varieties that the availability of appropriate intellectual protection be certain, and that it is both appropriate in scope and enforceable. It is the narrowness of protection afforded by plant variety protection certificates that makes the availability of plant utility patents and varieties made possible by the application of modern biotechnology to plants.

6. My biggest concern is that, unless there is quickly some standardization and rationalization of the mechanisms for protecting intellectual property, there will be delays and missed opportunities for agriculture to benefit from biotechnology. It seems as though questions regarding what is, and what is not, patentable are being left to the courts to decide rather than the patent office. If this trend is allowed to continue, it will result in delays in settling issues, high costs of litigation and severe restrictions on the exchange of biological material and information. Once the ownership of key patent areas has been established, it might be advantageous to have some type of arbitration system for establishing reasonable (mandatory?) licensing fees that reflect the contribution of the patent holder to the creation of the genetically engineered plant. University authorities and small biotechnology companies in particular will need some help in establishing realistic licensing policies/fees as they are not familiar with the business realities of the seed business.

B. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university or the general public?

1. Utility patents have served the nation effectively in numerous areas and will for inventions related to plants. Now that plants can be defined and modified chemically, they should be protected. Plant utility patents are in the best interest of the public and will not cause the world to go hungry.

2. The patent laws of the United States adequately protect plant science developments. Therefore, there are no compelling reasons to modify the patent laws based on this new development of genetic-engineering of plants.

3. U.S. Congress must pass legislation to insure utility patent protection remains in force.

4. We believe it is appropriate that Congress be informed that the availability and enforceability of utility patents on plants is extremely critical to the creation of the next generation of plants, created by modern biotechnology, which will make the next leap in productivity available to agriculture. The availability of utility patent protection for research and development resulting in inventions in plants is quite appropriate since it affords protection commensurate with the scope of the invention which is enabled by the applicant, in strong contrast to the plant patent and plant variety protection certificate systems in which protection is quite narrowly limited to a specific variety. Since modern biotechnology offers the promise of significant and quite broad advances in plant technology, the appropriate intellectual property protection for that technology should be commensurately broad, such as is possible with utility patents. Accordingly, it is inappropriate at this time to consider removing from utility patent protection either plants or animals or to restrict the availability or enforceability of these patents obtained in these areas.

5. Strong protection. Intellectual property protection is very important.

6. See item 6 above.

C. Research conducted by all responding biotechnology companies on the following plants:

Cotton, tomato, corn, rapeseed, tobacco, soybean, grass seed, vegetable seed, native plant seed, flower seed, mycorrhizal inoculum, nursery plants, specialty foods, potted and cut flowers, biotechnology products, sunflower, sesame, barley, peanuts, forest species (conifers), rice, garlic, lettuce, celery, and potato.

SEED COMPANIES

A. What concerns do you have regarding intellectual property protection (any type) for plants?

1. Genes and gene combinations only (or their manifestation as traits) should be protectable by utility patents but not the varieties which contain them which must be usable on an ongoing basis in a germ plasm pool. Furthermore, standard of equivalent cannot apply to plants and variety patents cannot be recreated by one "skilled in the art."

2. Large conglomerates have resources to invest in very expensive long-term technology. Plant utility patents would give these companies the opportunity to dominate the industry. It also would reduce continued improvements in varietal development, since plant utility patents will inhibit the use of newer developments for industry-wide improvements.

3. PVP law is inadequate as farmer/seedsmen and ginners blatantly reproduce and sell PVP varieties. Universities now have backcross programs and license small producers for a fraction of the cost of new varieties based specifically on leading commercial breeders.

4. My company has several concerns regarding the intellectual property protection for plants. We are in full agreement that the inventors or creators of man-made genes or the translocation of specific genes from one specie to another should have broad-based patent protection and exclusive rights to these inventions. We do not believe that plants developed and containing only naturally occurring genetic material should be protected by plant utility patents unless a research exemption is provided permitting the development of plant varieties using the patent genetic material resulting in new varieties that are different from the patented varieties.

A major concern is the lack of expertise in, and knowledge of, prior art within the Patent Office and the

lackadaisical (irresponsible) practice of issuing patents on plants that do not meet the criteria of unobviousness as was the case with the Patent Office issuing an oleic sunflower patent to the Agrigenetics Division of Lubrizol.

The negative responses to the survey regarding plant utility patents would be "strong agreement" if the above criteria was applied to plant utility patents.

5. Companies that have invested in development of new material have a right to be compensated for their investment; however, allowing companies to exclusively market products could be very damaging to second level seed companies and increase costs to the farmer due to limited competition. We must keep in mind, however, that we are dependent on many other countries for germ plasm which currently is openly shared in most cases.

6. Concerns that we have, as both marketers and developers of proprietary genetics, are the potential elimination of large germ plasm bases and for use as breeding and developmental material. On the one hand, we agree strongly that the proprietary rights of developers should both be protected and rewarded and at the same time, feel from a technical standpoint that due to the complex nature of plant material, it would be excessively restrictive to allow broad patents on varieties, inbreds, etc. which do not truly represent a substantial breakthrough. These types of restrictions could significantly stifle the development of new genetic products in the market.

7. A major concern is the issuance of patents for materials and/or processes that either have been in the public domain or which are really obvious to those skilled in the art, e.g., high oleic acid sunflower.

8. Will hinder the use of germ plasm and the development of new varieties. Who is going to evaluate all the implications of intellectual property protection? Breeders will have to become attorneys.

9. I am concerned that a combination of RFLP technology and utility patents will tie up whole segments of the genomes of species and lead to seed company/chemical company monopolies.

10. Plant utility patents appear to favor large firms with substantial investments in biotechnology. Concern regarding possible infringement (and fear of litigation) could be a negative factor. This could all focus the power and control of the seed market into relatively fewer hands.

11. The doctrine of equivalents for utility patents might be misused to afford protection for generic improvements thus blocking research in alternative genetic ways to effect the protected trait. The Lubrizol high oleic patent for sunflowers is an example. As written, the patent appears to block sale of any high oleic sunflower no matter what genetic means were used for their development.

12. (a) Inadequate protection regimes in certain non-U.S. markets.

(b) Overreaction by U.S. seed companies which fear unavailability of varieties, especially as a result of utility patents, followed by a sympathetic legislative response.

(c) Weakening of U.S. protection legislation (patents and PVP) will significantly discourage U.S. crop improvement, R&D investment and shift resources overseas.

13. We need a system which will encourage both biotechnical advance and advances via conventional breeding methods. I am concerned that broad-based patents of traits and varieties may severely curtail conventional breeding to improve these traits and varieties.

14. PVP's are good for inbred parents or self-pollinated varieties. Not desirable for F1 hybrids.

15. PVPA legislation is not strong enough. The law should more clearly define provisions against unauthorized multiplication - narrow farmer exemptions. Federal seed law accepts "PVP applied for" as PVP. But many states do not. Therefore, seed laws in states are not enforced until certificate is issued. Some certificates take 2-3 years before being issued.

16. Development of new lines (varieties) should not be stifled or complicated by any licensing regulations, though of course the proprietary nature of a product should be protected. Excessive records, bookkeeping, etc. should be minimized. Trade secrets of a company should be protected. Genetic diversity should be promoted.

17. There appears to be a movement afoot to provide for compulsory licensing of plant protection. Supporters of this movement are also in favor of prohibiting the protection of plant varieties by utility patent.

B. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university or the general public?

1. Properly enforced PVP laws adequately protect breeders' rights in varieties. Utility patents should only be granted for genes or groups of genes which do not occur normally and which result in beneficial non-obvious traits. If is reasonable that inventors of such new traits should be able to control their use.

2. We suggest not to allow the plant utility patent as it will inhibit the development of improved varieties. The patents will restrict the development of better varieties to a select group of large multinational organizations. It will limit competitiveness in the marketplace.

3. PVP law is too weak. Germ plasm development must be encouraged by proper full (equal to other intellectual property rights) protection. A simple aggressive backcross

program supported with a 3-generation per year winter nursery can steal and license a new derived variety with an insignificant change in 3 to 4 years. This was not the intent of Congress with the PVP law.

4. See item 4 above.

5. The general public is better protected, in my view, if public land grant universities continue to do basic research as well as variety and hybrid development. All resulting material should be intellectually protected and made available to the existing network of seed companies on a fee basis to multiply and retail to farmers. The bulk of this work if left totally to private industry tends to be dollar driven research and relatively short term focused. Almost all of the current materials for major crops being sold to farmers are derived from public development. However, through PVPA credit is not often given to the university or USDA and therefore farmers often have a wrong impression of where his greatest benefits originated.

6. Very close cooperation needs to take place between the Patent Office and the associations involved in the development of research of genetic material. We would also like to stress the need for a high degree of education and expertise by the patent board in its ability to truly evaluate the three criteria of novelty, utility and unobviousness as it relates to plant utility patents. In addition, Congress should realize that the broad farmer exemption which exists under PVPA is the largest disincentive for privately funded research on both the variety level and will be on the biotechnological level as well.

7. (a) The PVP system seems generally satisfactory but uncontrolled abuses under the Farmer Exemption Clause detract from its value as a stimulator for research investment in self-pollinated crops.

(b) The patent protection of intellectual property involving plants should apply only

to the actual biotechnologically developed genes and related transgenic events.

8. PVP is adequate for the seed industry and does not restrict the use of protected varieties for breeding purposes.

9. It is important that Land Grant University research in biotechnology maintain an independent status in its investigations and dissemination of knowledge. They should be free to pursue both basic (long-term) and applied (short-term) areas of biotechnology without heavy influence by one or few companies.

10. (a) PVP should abandon the concept of "distinctness" in favor of "minimum distance", thus affording protection similar to the utility patent's "doctrine of equivalents."

(b) The doctrine of equivalents applied to plants must be interpreted tightly to avoid patenting generic traits.

11. (a) Respondent intends to retain as trade secrets those developments which are not adequately protected in foreign markets or for which current protection in the U.S. becomes repealed.

(b) Respondent currently lawfully employs various patent disclosures in its product research and development and believes that in the absence of patent protection, such disclosures would be discontinued in preference to trade secret protection.

(c) PVP interferes with new line development more than patents because seed deposits are not available for R&D in exchange for rights granted (as with utility patents).

12. We feel that utility patents are necessary to protect valid biotechnological advances that do not have a commercial value in and of themselves. We also feel, however, that we must somehow encourage the use of these innovations in the development of improved

varieties. The following points further outline our position.

(a) We feel that only those genes and gene combinations that are not naturally occurring in the recipient plant species should be eligible for patenting. This would generally eliminate traits and/or varieties from being patented, but would include those genes transferred interspecifically or those genes constructed artificially by man. Anymore general allowance for patenting would surely have a limiting effect on conventional line and variety development.

(b) In order to insure a consistent supply of lines and varieties, our organization feels that a clause requiring mandatory and equitable licensing to be desirable. We should avoid "locing up" new discoveries to the extent that it will limit the further development of improved material. This is particularly true when one assumes that the enforcement of U.S. patent restrictions may well be inequitable in other parts of the world.

(c) In general, we feel that the intent of the Plant Variety Protection Act adequately protects lines and varieties. We do feel, however, that minimum distances must be more clearly defined in order to prevent the nearly exact recovery of protected lines and varieties through backcrossing and other methodology.

13. The Patent Office must upgrade its data base on the art of plant breeding. Too many trivial patents that are not unobvious are being approved. USDA or private industry must be consulted to help build this data base.

14. PVPA needs to be strengthened. Farmer exemption clause is severely abused.

15. See item 16 above. Also, value of i.e. PVP differs depending on whether the crop is self pollinated and the variety is sold, or if the crop is cross pollinated and the hybrid which is not covered is sold. This should be considered. Plant patents are more feasible for vegetatively propogated crops. Perhaps, techniques involved in biotechnology processes should be the patentable item and not the end product. Enforceability of any regulation should be considered.

16. The U.S. has been encouraging other countries to strengthen their intellectual property laws. Therefore, Congress should resist enacting special patent provisions for plants. Plant technology should be treated the same as other technology.

C. Research conducted by all responding seed companies on the following plants:

alfalfa, barley, broccoli, cabbage, cantaloupe, cauliflower, carrot, clover (trifolium repens and pratense), corn, cotton, cucumber, eggplant, fescue, geraniums, herbs, leafy greens, maize, marigolds, pearl millet, petunias, popcorn, Kentucky bluegrass, oats, orchardgrass, melons, radish, rape, red clover, rice, ryegrass, safflower, sorghum, soybean, squash, sudangrass, sugar beets, sunflower, sweet pepper, tobacco, tomato, watermelon, wheat and zinnias.

UNIVERSITIES

A. What concerns do you have regarding intellectual property protection (any type) for plants?

1. One should be able to protect all forms of "plant" life from the lowest to the highest form of organism in any manner feasible. There should be no difference in protection based on forms of reproduction.

2. Plant utility patents can be both beneficial and/or harmful to the university and the general public depending on what is patented, what changes are improved for licensing, and whether licensing is mandatory or not. Much depends of whether one (the university) is on the outside or the inside of major new developments.

3. Several countries have put restrictions on releasing germ plasm to the United States or other countries. Any restrictions or protection placed on our materials will not improve relationships in regard to increases sharing of basic plant natural resources.

4. The intellectual property should be real intellectual property; that is, the owner(s) should be the person(s) who first elucidated the mechanism or otherwise described the specific characteristic(s) in question. Such protection should not accrue to those who just happen to have the material in their possession. Also, the protection should be defined fairly narrowly, so it does not inhibit development of closely related types.

5. Basically, we are not concerned about protection under the 1930 Plant Patent Act or the 1970 Plant Variety Protection Act. We are concerned about general utility patents on plants, particularly if they do not allow for experimental or research use. A research exemption is necessary in order to allow breeders an opportunity to utilize a state of the art germplasm base in order to make future improvements. The principal of dependence concerns us greatly as it is our understanding that only the owner of the utility patent can use the patented plant

for research and others would have to have a dependency license. The other concern about the utility patent for plants is that it can be written so broadly, particularly when compared to the Plant Variety Protection Act, and it is our understanding that this breadth can void both the research exemption and the farmers exemption. Also, a utility patent could probably be used to protect an almost unlimited number of varieties or cultivars because of the generic fashion or of the generic way in which it could be fashioned.

6. That the system compensates the development person and make available resources for new plant materials.

B. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university of the general public?

1. Every effort should be made to afford protection to intellectual property in order to encourage new developments and make investments in research feasible.

2. Today, free exchange of germ plasm, especially in the form of new varieties, occurs between public and private research. With plant utility patents, one can visualize a day when new varieties will consist of genes brought together by licensing from various sources. Thus, all new varieties could be extremely high priced and available only to the most prosperous.

3. There may be opportunities for short term economic benefits through some system of protection. In the long term, protection, especially utility patents, will reduce the widespread exchange of germplasm. Thus, reducing the overall benefits to the public we serve and who are the primary source of our funds. Protection of any kind will undoubtedly increase costs to all.

4. Protection is useful and stimulates development. It should be construed fairly narrowly so as not to inhibit other developments. Protection should be granted

only where real effort and expertise went into the development of the potential and/or material.

5. See item 5 above.

6. Intellectual property protection will provide an incentive to both industry and university to develop new plant materials and will compensate in part those who expend energy, talent and resources in the development of new materials.

C. Research conducted by all responding universities on the following plants:

Alfalfa, apples, barley, beans, bell peppers, blackberries, blueberries, carrots, corn, floral crops, fruit trees, small grains, grapes, all horticulture crops, landscape plants, lillies, mums, oats, raspberries, sorghum, soybeans, spelt, strawberries, tomato, trees, turf grass, walnut trees, wheat.

NURSERIES AND OTHER

A. What concerns do you have regarding intellectual property protection (any type) for plants?

1. That protecting, as provided by Plant Patent Act, not be diluted but strengthened by further amendments or rules; closer cooperation with other countries; and protection of end product be assured, as in our business, cut flowers.

2. Plant protection is, and always will be, limited in strength as long as the final product (e.g., unrooted cuttings) are fully protected. With the single claim system of U.S. plant patents, it is very questionable whether or not this "end product" is covered. Also, the great range in protectable plants from country to country is a major problem, from both a financial and a control aspect.

B. What information would you like communicated to Congress regarding intellectual property protection for plants which you believe will benefit your business/university of the general public?

1. See item 1 above.

2. See item 2 above.

C. Research conducted by all responding nurseries on the following plants:

Roses, dianthus, Crapemyrtle, holly, rhododendron, deciduous flowering shrubs, selected ornamental broadleaves, begonias, New Guinea Impatiens, poinsettias, and kalanchoes.